2015-1603, -1657

In The

United States Court of Appeals

For The Federal Circuit

INTELLIGENT VERIFICATION SYSTEMS, LLC.,

Plaintiff – Appellant,

v.

MAJESCO ENTERTAINMENT CO., MICROSOFT CORP.,

Defendants – Cross-Appellants.

APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF VIRGINIA IN NO. 2:12-CV-00525-AWA-LRL, JUDGE ARENDA L. WRIGHT ALLEN.

NON-CONFIDENTIAL BRIEF OF APPELLANT

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CERTIFICATE OF INTEREST

Pursuant to Federal Circuit Rules 26.1 and 47.4, counsel for Plaintiff-Appellant certify the following:

1.   The full name of every party or amicus represented by us is:

Intelligent Verification Systems, LLC.

2.   The name of the real party in interest (if the party named in the caption is not the real party in interest) represented:

The party named in the caption is the real party in interest.

3.   All parent corporations and any publicly held companies that own 10 percent or more of the stock of the party or amicus curiae represented:

None.

4.   The names of all law firms and the attorneys that appeared for the party now represented in the trial court or are expected to appear in this Court are:

BIRCH, STEWART, KOLASCH, & BIRCH LLP: Michael K. Mutter, Robert J. Kenney, Quentin R. Corrie, John D.V. Ferman, Lynde F. Herzbach, Stephanie D. Grosvenor, Michael T. Smith, and Michael B. Marion (no longer with BSKB).

[NOTE: Lead counsel may consult with Joel Freed and Alexander Ott of McDermott, Will & Emery, LLP, although they will not enter an appearance in this Appeal.]

Dated: June 29, 2015   Respectfully submitted,

/s/ Michael K. Mutter
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STATEMENT REGARDING CONFIDENTIAL MATERIAL OMITTED

The material omitted from the right-hand portion of the table on page 12 and in footnote 2 on the same page consists of the hardware component costs of an accused product and calculations based on same; the material omitted from the table on page 13 and in the text on the same page indicates accused product costs, sale prices, apportionment percentages, and royalty calculations based on same.

TABLE OF AUTHORITIES

Page(s)

CASES

STATEMENT OF RELATED CASES

Intelligent Verification Systems, LLC ("IVS") is not aware of any cases related to the present appeal.

STATEMENT OF JURISDICTION

The district court had jurisdiction under 28 U.S.C. §§ 1331 and 1338(a). The district court entered final judgment and dismissed IVS' claims on April 8, 2015 (JA1-2). IVS filed its notice of appeal under 28 U.S.C. § 2107(a) and Fed. R. App. P. 4(a) on April 24, 2015 (JA7895-7897). This Court has exclusive jurisdiction under 28 U.S.C. § 1295(a)(1).

STATEMENT OF ISSUES

1.   Whether the district court applied the wrong standard of comparability when excluding IVS' experts' comparable license opinions and compounded that error by acting as a factfinder regarding the underlying technologies and failing to consider the opinions of IVS' technical expert.

2.   Whether the district court erred in excluding IVS' damages expert's form-of-license opinion when that form (a running royalty) was common to thirteen different Microsoft licenses covering the accused products.

3.   Whether the district court erred in finding insufficient apportionment when IVS' damages expert expressly apportioned the royalty base to only those hardware components involved in practicing the patented technology.

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STATEMENT OF THE CASE

A.   The Patent-in-Suit

On January 19, 1999, the provisional application that eventually resulted in IVS' U.S. Patent No. 7,062,073 to Tumey, et al. ("**the '073 Patent**") was filed; the '073 Patent issued on June 13, 2006. (JA82-98). From a broad perspective, the '073 Patent uses biometrics, specifically facial recognition, during entertaining interactions with an interactive entertainment apparatus. In its claim construction order, the district court stated that the '073 Patent "describes an entertainment apparatus, inclusive of video games and associated subsystems, that utilizes biometric facial recognition in order to facilitate end-user interaction, entertainment and enjoyment." (JA1977) ("*Markman* Order"). Previously, facial recognition was used in security applications, such as a facial scan to access a locked door. The technology and considerations needed to implement facial recognition in security applications are different from the invention of the '073 Patent. Implementation of the invention, such as in video games, requires faster responses and interactions than in a security application, with less emphasis on accuracy and limiting access. The '073 Patent is neither solely directed to facial recognition nor only input. The invention can be implemented in various types of interactive entertainment apparatus, such as toys and video games. (JA82-98).

One embodiment claimed in the '073 Patent is an animated toy or video game system capable of recognizing human users and select inanimate objects with human-like faces and interacting with the human user. (JA82, JA92). The entertainment system provides entertaining interaction in response to the output signal result of facial recognition. (JA82, JA92, JA97). The entertainment system is also capable of learning and storing information about users and may interact with human users on both an individual basis and on a generic, non-specific basis. (JA82, JA85).

B.   The Accused Products and IVS' Infringement Case

In November 2010, Microsoft launched the Kinect, an accessory designed to be used with its pre-existing Xbox 360 gaming console (released in 2005). (JA13786). The marketing slogan for the Kinect was, "You are the controller." (JA13851). Together, an Xbox console (with Kinect-updated software), a game, and the Kinect provide a "natural user interface" by allowing game play to be controlled by tracking players' identities and body movements instead of handheld controllers. (*e.g.*, JA13856, referencing MS_IVS00043483-00043486 and MS_IVS00260278-00260284).

Microsoft and the video game industry touted the Kinect as a "groundbreaking," "transformative," and "revolutionary" development that would help Microsoft to "defy gravity." (JA13863). The Kinect is the fastest-selling

consumer electronics device in history, and the Xbox 360 console experienced record sales figures after Kinect's release. (JA13825, JA13926).

On September 20, 2012, IVS sued Defendants for infringement of the '073 Patent. As contended by IVS, the combination of an Xbox console, a Kinect, and certain Kinect games form an infringing "entertainment apparatus" as claimed in the '073 Patent. More specifically, an Xbox game console (with the necessary Application User Interface, or "API") and an accused game form the "entertainment device;" the combination of an Xbox game console and a Kinect form the "acquisition device;" the Xbox gaming system includes the "processor;" and together, these components form an "entertainment apparatus" that provides "entertaining interaction immediately upon receipt" of an "output signal indicative of recognition" by using facial recognition technology to link players with their skeletons during game play. (JA660-673, JA4773-4805). IVS filed a motion for partial summary judgment on the issue of infringement detailing facts supporting these contentions. (JA4763-4768, JA4773-4805).

C.   The Immersion Patents and Underlying Technology

Two patents assigned to the Immersion Corporation, U.S. Patent Nos. 6,275,213 ("the '213 patent") and 6,424,333 ("the '333 patent"), are relevant because IVS' technical expert, V. Thomas Rhyne, III, Ph.D., P.E., R.P.A., concluded that the technology of these patents and the infringing Sony game

system are comparable to the technology of the present suit, and IVS' damages expert, Mr. Walt Bratic, relied on a royalty rate adopted by the judgment of the *Immersion v. Sony* litigation to support his damages opinion. (JA13874, JA13875).

The two Immersion patents are both titled "Tactile feedback man-machine interface device." (JA23712-23753, JA23754-23789). The '213 patent relates to "[v]irtual reality" and "an immersive environment which is created by a computer and with which users have real-time, multisensorial interactions" that "involve some or all of the human senses through either visual feedback, sound, force and tactile feedback (*i.e.* reflection), smell and even taste." (JA23735). "The key to immersive realism" provided by the Immersion invention "is the capacity of the user to use his/her hand to interactively manipulate virtual objects." (JA23735).

The Immersion patents' "man-machine interface … may be employed in such areas as interactive computer applications . . . , gesture recognition . . . , entertainment…" (JA23735). For example, in Fig. 19A of the '213 Patent, there are arrows between the computer and the sensing gloves in both directions (*see* red box). (JA23726). The '333 patent also includes an example interaction where "the user may perceive a **cause-and-effect** relationship between motion of his fingertip and the level of vibration he feels."
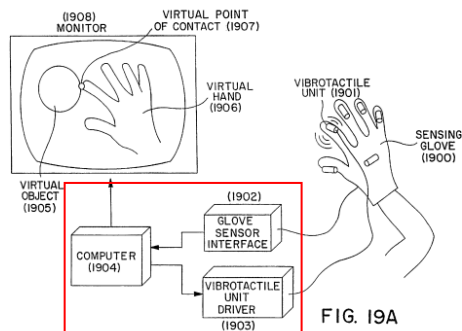
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(JA23785) (emphasis added). The "invention promotes a sensation of immersion in a virtual environment **where the user is able to interact with virtual objects as if he were interacting with physical objects in a physical environment**." (JA23785) (emphasis added). The user's input, *i.e.* motion of his fingertip, is related to and affects the output, *i.e.* level of vibration. (JA23785). In another embodiment, the '333 patent states "[t]he user may see a graphical representation of his/her body part interact with virtual objects and simultaneously feel a corresponding tactile sensation simulating the interaction." (JA23779).

D.   IVS' Experts

1.   IVS' Technical expert - Dr. Thomas Rhyne

Dr. Rhyne, IVS' technical expert, described the technical comparability between, on the one hand, 1) the '073 Patent and Defendants' accused gaming systems and, on the other hand, 2) the Immersion patents and the Sony infringing gaming system. (JA15276-15282). Both technologies relate to entertainment systems with "man-machine interfaces" (JA15278-15279 at ¶ 313) that "enhance game play [in video games and entertainment] by providing improvements related specifically to game control during play" (JA15278 at ¶ 312). It is Dr. Rhyne's opinion that the "infringing Sony technology addressed in the recent *Immersion v. Sony* judgment is the instance of a judgment or license I am aware of that, in my

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opinion, is most relevant and most comparable to the technology of the '073 Patent as embodied in the Xbox 360 and Xbox One Kinect Gaming Systems." (JA15278).

In Dr. Rhyne's opinion, "[t]he '073 Patent represents a major contribution to entertainment and video games." (JA15276). Dr. Rhyne also evaluated the infringing Sony gaming system and the Immersion patents, the '213 and '333 patents. His Opening Report stated that "[l]ike the technology of the'073 Patent, the *Immersion v. Sony* litigation dealt with technologies in the gaming field, including technologies which enhance game play by providing improvements related specifically to game control during play." (JA15278).

Dr. Rhyne further opined that the Immersion "patents are directed to a man-machine interface which provides tactile feedback also known as 'haptic' feedback …. Such feedback, for example, can be provided by having a vibrational device in a game controller and can be implemented by a mass-moving actuator (*e.g.*, an eccentric mass mounted on the shaft of a small motor) that has been mounted to a sensing body part (*e.g.*, directly on a player's hand or within a hand-held game controller)." (JA15278-15279). "The Immersion patents further disclose that the tactile feedback system can be used in a variety of applications, including entertainment … An exemplary entertainment application of the claimed feedback system simulates wind or water flow while the user is viewing a beach

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scene." (JA15278-15279). Dr. Rhyne specifically noted that "[t]he claims at issue in the Immersion litigation were found to cover the tactile feedback system used in the Playstation Dual-Shock Controller, together with the Playstation Console and Playstation games that used that system. (Immersion special jury verdict)." (JA15279).   Like the infringing gaming system in the Immersion litigation consisting of a console, controller, and game, the assumed-infringing gaming system accused in this case includes the Xbox 360 or Xbox One Console, the Kinect (which replaced the controller), and Kinect games. (JA15224, JA15232).

Dr. Rhyne compared the Immersion patents and the infringing Sony game system in the Immersion/Sony litigation with the '073 Patent and Defendants' accused game systems. (JA15279-15282).

Dr. Rhyne reaffirmed his opinions on comparability in his Surrebuttal Report. (JA15791). Defendants did not challenge Dr. Rhyne's qualifications or file any *Daubert* motion to exclude his technical opinions. Defendants did not question Dr. Rhyne at his expert deposition regarding his opinions on technical comparability of the Immersion patents and infringing Sony game system other than to confirm his opinions set forth in his reports. (JA15868, JA15873).

2.   IVS' Damages Expert - Mr. Walter Bratic

On September 26, 2014, Mr. Bratic, IVS' damages expert, submitted his initial expert report.   (JA13774-13977).   After setting forth his qualifications,

scope of engagement, information reviewed, and a summary of his opinions, the report analyzes reasonable royalty damages. (JA13805-13889). The analysis includes a detailed discussion of each of the 15 *Georgia-Pacific* factors. (JA13808-13881). Out of the 15, Mr. Bratic concluded that factors 2 (JA13808-13811), 5 (JA13812), 8 (JA13820-13841), 9 and 10 (JA13842-13863), 11 (JA13863-13864), 12 (JA13864-13876), 13 (JA13876-13881), 14 (JA13881), and 15 (JA13881-13883) have an impact on the reasonable royalty. Mr. Bratic consulted with Dr. Rhyne and relied on his opinions on technical matters. (JA13878).

In his discussion of *Georgia-Pacific* factor 2, Mr. Bratic considered all licenses he knew Microsoft had produced in the case. (JA13808-13811). These licenses were for technology Microsoft had implemented in the accused products. (JA13808). However, based on Dr. Rhyne's technical opinions conveyed to Mr. Bratic, none of these agreements involved comparable technology. (JA13808). Therefore, Mr. Bratic considered these licenses to be instructive only of "Microsoft's licensing structure when licensing in technology related to its video gaming products," which tended to be royalties paid on a per-unit sold basis. (JA13808-13811).

When determining the relevant royalty rate, Mr. Bratic "conducted research regarding royalty rates for potentially comparable technology in the public

domain." (JA13864). Mr. Bratic relied on a court-imposed royalty on a system consisting of Sony Corporation's PlayStation console, Dual Shock controllers, and related games that infringe the two Immersion patents. (JA13872-13876). During the process of choosing the Immersion/Sony license, Mr. Bratic considered several agreements entered into by Immersion, including two agreements with Logitech, one cross-license with Microsoft, a settlement agreement with Microsoft, and the court-imposed royalty. (JA13865-13873). Again, Mr. Bratic's analysis relied on the technical opinions of Dr. Rhyne. (JA13867, JA13869, JA13870, JA13873, JA13874).

Mr. Bratic concluded that "the 1.37% royalty rate from the Immersion/Sony trial provides the most guidance as to the reasonable royalty because the Sony products found to infringe the Immersion Patents-in-Suit (i.e., PlayStation consoles, Dual Shock controllers, and games) were similar to the Accused Hardware Products (i.e., Microsoft Xbox 360 and Xbox One consoles and sensors) and the Accused Games, whereas the prior agreements with Logitech involved only gaming peripherals (i.e. joysticks and mice)." (JA13875).

Mr. Bratic took "into account recent developments in the case law relating to patent litigation," including *Uniloc USA, Inc. v. Microsoft Corporation, 426 Fed. Appx. 905*, *LaserDynamics, Inc. v. Quanta Computer, Inc., 694 F.3d 51,* and *VirnetX, Inc., v Cisco Systems, Inc., 767 F.3d 1308.* (JA13876-13877). He noted,

"the entire market value rule does not apply to the facts of this case." (JA13877).

Mr. Bratic acknowledged Dr. Rhyne's opinion that the accused products have been successful not only due to IVS' patented technology "but also because of other technologies incorporated within these products that are not covered by the Patent-in-Suit." (JA13877 at ¶ 234). Mr. Bratic "relied upon the opinions of Dr. Rhyne to determine the value and/or benefit specifically attributed to the technology taught by the Patent-in-Suit." (JA13877 at ¶ 234). He "incorporated Dr. Rhyne's apportionment of the Accused Hardware Products into … [own] analysis of the appropriate royalty base," with the result that "the reasonable royalty that would have resulted from a hypothetical negotiation between the parties would not be based on the entire sales price of the Accused Hardware Products." (JA13877 at ¶ 234). Thus, Mr. Bratic did not use the entire accused products as the royalty base, "but instead considered only those components that implement the technology taught by the Patent-in-Suit, which represents the 'smallest salable patent-practicing unit,' to be included as the appropriate royalty base." (JA13877 at ¶ 235).[1]   A

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[1] Although Mr. Bratic's report refers to the apportioned components related to the patented technology within the Xbox and Kinect plus the accused games as the "smallest salable patent-practicing unit" or "SSPPU," the subset of apportioned components Mr. Bratic used as the royalty base is not and never was "salable" or actually sold by Microsoft. Both the Xbox and Kinect are needed to be "patent practicing," and neither Xbox nor Kinect is sold in smaller units. During his deposition, Mr. Bratic clarified that his royalty base is accurately denominated as the "apportioned SSPPU." (JA14235). Mr. Bratic's apportioned SSPPU *represents* the SSPPU in establishing the damages base, given that Defendants do not sell the hardware components of the accused products separately.

CONFIDENTIAL MATERIAL OMITTED

portion of a typical hardware component apportionment breakdown generated by

Mr. Bratic looks like this:

	Component Implicated by PIS [1]	FY10 [2]			
		Q1	Q2	Q3	Q4
CPU	Yes	██	██	██	██
GPU	Yes				
DVD	Yes	██	██	██	██
HDD	Yes	██	██	██	██
HDDM	No				
Memory	Yes				
ANA	Yes				
AV Pack	No				
Gamepad	No				
Headset	No				
Power Supply	Yes				
Radio	No				
Southbridge	No				
Mfg & Pack	No				
Mech & ID	No				
Motherboard	Yes				
Transformation	No				
Other	No				
Total Product Cost		██	██	██	██
Total Costs of Components Implicated by PIS		██	██	██	██
% Apportionment		██	██	██	██

Sources:
[1] Interview of Dr. Rhyne, IVS' technical expert.
[2] MS_IVS00302379.

(JA13959). In this example, Mr. Bratic included 8 out of 18 hardware components

listed in Microsoft's Bill of Materials ("BOM") for an accused game console in his

royalty base because, according to Dr. Rhyne, the patent-in-suit implicated those

eight which implement the patented technology.[2] (JA13878). Mr. Bratic then

generated an "apportioned royalty base" by applying the percentage of value of the

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[2] As can be seen in the example table, on a value basis these 8 components amounted to between ███ and ███ of the cost of the total component costs in the year 2010.

CONFIDENTIAL MATERIAL OMITTED

patent-practicing hardware components to the average sale price of the accused

products, as shown by the following summary table:

Microsoft Apportioned Royalty Base Analysis [591]					
Accused Product	Average Total Product Cost	Average Costs of SSPPU	Average %	ASP	Apportioned Royalty Base
Kinect[592]	██████	██████	██████	██████	██████
Xbox 360	██████	██████	██████	██████	██████
Xbox One	██████	██████	██████	██████	██████

(JA13879).

Mr. Bratic concluded his analysis of *Georgia-Pacific* factor 13 by explaining

why he thought a per-unit running royalty structure was the most appropriate.

(JA13880-13881).

Ultimately, Mr. Bratic concluded that a 4.11% rate should be applied to the

apportioned royalty base. (JA13883-13889). Given his opinion that a per-unit

royalty was appropriate, he applied the 4.11% royalty rate to the apportioned base

to calculate per-unit royalties of ████ per Kinect, ████ per Xbox 360 console,

████ for Kinect/Xbox game console bundles, and ████ per video game.

(JA13777-13779, JA13885-13888). He then performed further calculations based

on available sales data of the accused products to reach reasonable royalty

conclusions expressed in dollar figures. (JA13886-13889). The number of game

consoles included in the calculations was equal only to the total number of Kinects sold. (JA13886-13888).

E.   Status of the Underlying District Court Case

Defendants did not challenge Mr. Bratic's qualifications.[3] However, they did file both a *Daubert* motion directed at his opinions and motions *in limine* directed at materials he had considered and on which he had relied. (JA6108-6110, JA6081-6107, JA6238-6243, JA6244-6266). Defendants argued, *inter alia*, that Mr. Bratic failed to apportion damages in accordance with this Court's precedents that he improperly relied on technically non-comparable licenses in forming his opinions. IVS opposed the motions. (JA6173-6196, JA6492-6521, JA6100-6105).

On March 24, 2015, Magistrate Judge Leonard issued a Memorandum Opinion and Order regarding the pending motions *in limine* and the *Daubert* motions directed at the damages experts. (JA6-37). The Order granted Defendants' motion to exclude Mr. Bratic and their related motions *in limine*. (JA28-37).

Defendants then filed a Motion for Partial Summary Judgment that IVS was not entitled to reasonable royalty damages, seeking dismissal of IVS' claims with prejudice based on an argument that Mr. Bratic's exclusion meant that IVS lacked evidence sufficient to establish a reasonable royalty. (JA6781-7102). IVS, while maintaining its Objections to the Order (and all related rights), ultimately

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[3] Defendants' counsel apparently have retained both Dr. Rhyne and Mr. Bratic as experts previously. (JA6736-6740).

stipulated that if the district court overruled its Objections to the Order in relation to damages, it would not oppose Defendants' motion.   (JA7886-7887). Defendants, in exchange, stipulated that if IVS' Objections to the Order were overruled, they would seek dismissal of all of their counterclaims without prejudice. (JA7886-7887).

The district court overruled IVS' Objections to the Magistrate Judge's Order, finding it "to be sound and free from any error." (JA5). Based on this ruling, Microsoft filed an Unopposed Motion for Entry of Summary Judgment Order and proposed Order seeking dismissal of IVS' case with prejudice and dismissal of their counterclaims without prejudice. On April 8, 2015, the district court granted Microsoft's motion and entered a final judgment, dismissing IVS' patent infringement case with prejudice and dismissing Microsoft's Counterclaims of patent invalidity without prejudice. This appeal followed.

SUMMARY OF ARGUMENT

The Order finds that the Immersion/Sony license does not meet the standard for minimum comparability, but in doing so it misapplies the standard for determining minimum technical comparability of licenses, ignores the unchallenged opinions of IVS' technical expert, and reaches unsupported factual conclusions regarding the asserted patent and accused products as well as the Immersion patent and infringing Sony products. The Order fails to consider Dr.

Rhyne's unchallenged opinions regarding technical comparability and instead relies on its own factual findings that the '073 Patent was limited to "input" and the Immersion patents are limited to "output." However, the Order's factual findings lack citation to evidentiary support. The Order ignores evidence and expert opinion demonstrating that the two Immersion patents and infringing Sony game system are at least minimally technically comparable to the '073 Patent and Defendants' accused game systems. The technical comparison opinions of IVS' experts do not have to rest on a flawless foundation, just a minimally reliable one, with an analysis "sufficiently related to the disputed issue." *i4i Ltd. P'ship v. Microsoft Corp.*, 598 F.3d 831, 855-56 (Fed. Cir. 2010).

The Order excludes Mr. Bratic's opinion regarding the form of royalty, even though that opinion is based on thirteen different Microsoft licenses covering the accused products. It was uncontested that the agreements and other Microsoft documents reviewed by Mr. Bratic reveal that when Microsoft has licensed-in technology for the accused products, its typical license structure has involved an up-front license fee and a per-unit running royalty. Mr. Bratic expressly avoided using the referenced documents to support his computation of the royalty rate. It is undisputed that Mr. Bratic specifically limited his use of the agreements solely to support the structure, not the rate. Such limited use is proper under the law, regardless of which specific *Georgia-Pacific* factor includes the form analysis.

Furthermore, Mr. Bratic offered additional, independent reasons for the form of royalty he chose, which the Order ignores.

Mr. Bratic properly apportioned the royalty base upon which his reasonable royalty relies to include only those patented features necessary for practicing the patent. This apportioned royalty base represents the smallest salable patent-practicing unit ("SSPPU"). The apportionment is in accordance with this Court's precedents. The Order excluded Mr. Bratic's opinions because of a failure to further apportion the royalty base by "apportion[ing] . . . the value of the patented feature[s]" to which he already had apportioned." (JA24). There is no support for requiring such further apportionment. "It is not the case that the value of all conventional elements must be subtracted from the value of the patented invention as a whole when assessing damages." *Astrazeneca AB v. Apotex Corp.*, 782 F.3d 1324, 1339 (Fed. Cir. 2015).

Finally, the Order errs by granting the related motions *in limine* and excluding evidence of Defendants' sales volume (as opposed to sales revenue). (JA34) (granting Defendants' Motion *in Limine* No. 3). There is no basis to exclude such highly relevant evidence.

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STANDARD OF REVIEW

A district court's decision to admit or exclude evidence, including expert evidence, is reviewed for abuse of discretion. *See United States ex rel. Ubl v. IIF Data Solutions*, 650 F.3d 445, 454 (4th Cir. 2011); *Cheese Sys. v. Tetra Pak Cheese & Powder Sys.*, 725 F.3d 1341, 1348 (Fed. Cir. 2013) (citing *GE v. Joiner*, 522 U.S. 136, 139 (1997)). "A district court by definition abuses its discretion when it makes an error of law." *Koon v. United States*, 518 U.S. 81, 100 (1996); *see also United States v. Basham*, 561 F.3d 302, 325-26 (4th Cir. 2009). Conclusions of law are subject to plenary, *de novo* review. *League of Women Voters of N.C. v. North Carolina*, 769 F.3d 224, 235 (4th Cir. 2014); *Nat'l Steel Car, Ltd. v. Canadian Pac. Ry., Ltd.*, 357 F.3d 1319, 1325 (Fed. Cir. 2004). Discretion also "may be abused by an exercise that is flawed by erroneous factual or legal premises." *James v. Jacobson*, 6 F.3d 233, 239 (4th Cir. 1993) (citation omitted). "[W]hile it is important to guard against compensation for more than the added value attributable to an invention, it is improper to assume that a conventional element cannot be rendered more valuable by its use in combination with an invention." *Astrazeneca*, 782 F.3d at 1338.

"[I]t is not a district court's role under *Daubert* to evaluate the correctness of facts underlying an expert's testimony." *i4i*, 598 F.3d at 856. In making findings of fact, a court abuses its discretion if it ignores substantial evidence. *Jiminez v.*

Mary Washington College, 57 F.3d 369, 384 (4th Cir. Va. 1995); *see also Winter v. NRDC, Inc.*, 555 U.S. 7, 29 (2008); *Evans v. Metro. Life Ins. Co.*, 358 F.3d 307, 312 (4th Cir. 2004) (abuse of discretion includes not considering evidence); *Custom Accessories, Inc. v. Jeffrey-Allan Industries, Inc.*, 807 F.2d 955, 960 (Fed. Cir. 1986). Reversal for abuse of discretion is required when, after reviewing the record, the appellate court has "a definite and firm conviction that the court below committed a clear error of judgment in the conclusion it reached upon a weighing of the relevant factors." *Westberry v. Gislaved Gummi AB*, 178 F.3d 257, 261 (4th Cir. 1999). Likewise, "[a]n abuse of discretion may be established under Federal Circuit law by showing that the court made a clear error of judgment in weighing the relevant factors or exercised its discretion based on an error of law or clearly erroneous fact finding." *Judkins v. HT Window Fashion Corp.*, 529 F.3d 1334, 1339 (Fed. Cir. 2008) (quoting *Abbott Labs. v. Torpharm, Inc.*, 503 F.3d 1372, 1380 (Fed. Cir. 2007)). "An attorney's unsworn argument does not constitute evidence." *United States v. White*, 366 F.3d 291, 300 (4th Cir. 2004); *accord*, *Gemtron Corp. v. Saint-Gobain Corp.*, 572 F.3d 1371, 1380 (Fed. Cir. 2009); *Invitrogen Corp. v. Clontech Labs., Inc.*, 429 F.3d 1052, 1068 (Fed. Cir. 2005).

ARGUMENT

A.   Exclusion of Evidence on the Immersion/Sony Verdict and License as Not "Sufficiently Related" Was Wrong

The Order ignores evidence demonstrating technical comparability, misstates many of IVS' arguments, ignores important precedent, and reaches legally and factually incorrect conclusions, including that the Sony/Immersion license did not meet the minimum comparability standard. As further explained below, the Sony/Immersion license meets the standard for technical comparability and Mr. Bratic's opinion relying on that license should be reinstated.

Defendants never challenged Mr. Bratic's expert qualifications and the district court did not find that he was unqualified. Defendants also did not challenge Mr. Bratic's reliance on Dr. Rhyne's technical opinions regarding royalty rate or seek to exclude Dr. Rhyne's opinions regarding technical comparability. The district court excluded the Sony/Immersion license and Mr. Bratic's opinion regarding that license based on its assessment of the weight of the evidence regarding technical comparability. Those issues must be returned to the jury.

1.   The Minimum Threshold Comparability Analysis is Based on Incorrect, Unsupported Findings of Fact

The district court made findings of fact regarding the technology at issue in this case and the comparable technology of the *Immersion v. Sony* litigation (JA15-20), including:

- "IVS' patented technology primarily functions as an input device, using facial recognition technology to acquire information about the player."

- "Conversely, the Immersion/Sony technology primarily functioned as an output device, using haptic feedback to signal the player as to game play changes."

- "Even more importantly, the Immersion/Sony technology was simply a modification of a handheld game controller, whereas the IVS' patented technology of facial recognition displaces the need for handheld game controllers, resulting in a fundamental change in game play."

(JA18). The Order makes these findings without any citation to the record.

Both Mr. Bratic and Dr. Rhyne provided their underlying reasoning and overall opinions regarding the comparability of the Sony/Immersion license. (JA13872-13876, JA15278-15282, JA15791). Without addressing Dr. Rhyne's reasoning on the issue, the Order incorrectly characterizes both Mr. Bratic's and Dr. Rhyne's opinions regarding the Sony/Immersion license as "cursory" and lacking explanation. (JA16-17). Mr. Bratic included an analysis of the Immersion Corporation, including its marketing statements and licensing history (JA13865-13866), a 1996 Immersion and Logitech license (JA13866-13867), a 1998

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Immersion and Logitech license (JA13867-13869), the Immersion and Microsoft interactions including a 1999 cross license and litigation/settlement (JA13869-13871), and the Immersion and Sony litigation including jury verdict (JA13872-13874). Mr. Bratic relied on Dr. Rhyne for any underlying technical analysis, such as an evaluation of the relevant Immersion patents, when identified. (JA13865-13874).

Dr. Rhyne opined on both the utility and advantages of IVS' '073 Patent and Defendants' game systems, as well as the Immersion patents and infringing Sony game system, in addition to a comparison of the two.[4] (JA15276-15282). As described in Dr. Rhyne's expert reports, and above, both technologies include entertainment systems with "man-machine interfaces" (JA15278) that "enhance game play [in video games and entertainment] by providing improvements related specifically to game control during play." (JA15277). Dr. Rhyne specifically opined that the Immersion patents and infringing Sony game system is most relevant and most comparable to the technology of the '073 Patent and the Xbox

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[4] Dr. Rhyne is a highly-qualified engineer with five decades of experience in academia, research, and private industry within computer technology, including programming and video game development. He also possesses Electrical Engineering, Computer Engineering, and Computer Science technical degrees. (JA15177-15181, JA15284-15296). Dr. Rhyne's qualifications and status as a technical expert in this case were not challenged. Yet, the district court deemed it was in a better position to make technical findings than Dr. Rhyne.

360 and Xbox One Kinect game systems." (JA15278).[5] The evidence provided by

IVS' experts was far more than cursory.

The Order fails to consider Dr. Rhyne's technical opinions and Mr. Bratic's

opinions on comparability of the Sony/Immersion license. The issue Defendants

raised concerning the Sony/Immersion license was technical comparability. Mr.

Bratic properly relied on Dr. Rhyne, who provided a discernible link between the

Immersion patents and infringing Sony game system as compared with the '073

Patent and accused Xbox game systems. Based on that link the Sony/Immersion

license meets the "comparability" principle as set forth in *Lucent*, *ResQNet*, and

LaserDynamics. (JA6174-6175); *see also Lucent Techs., Inc. v. Gateway, Inc.*,

580 F.3d 1301, 1325 (Fed. Cir. 2009). Contrary to the Order's findings, the

connection between the two does not "relate generally to an 'interface'" (JA18),

and this situation is far different from the one in *Lucent*.[6] *Compare* (JA18) to

Lucent, 580 F.3d at 1328.

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[5] This opinion was not challenged with a *Daubert* motion.

[6] Another way this case differs from *Lucent* is in regards to the technical opinion or facts that form the basis for the comparability analysis. In *Lucent*, this Court evaluated Lucent's brief and its own characterizations of the four agreements as covering "PC-related" patents. 580 F.3d at 1328. The Court in *Lucent* also factored in the difference between "multiple patents to broad, PC-related technologies" and "only one patent … directed to a narrower method." *Id*. Here, the analysis is based on the district court's own unsupported factual findings, which are contrary to and ignore IVS' arguments and experts' opinions.

Dr. Rhyne explained that both the '073 Patent and the Immersion patents deal with "technology which enhance game play by providing improvements related specifically to game control during play." (JA15278). Further, the background section of one of the two Immersion patents, the '213 Patent, states: "[v]irtual reality (VR) is an immersive environment which is created by a computer and with which users have real-time, multisensorial *interactions* … these interactions involve some or all of the human senses through either visual feedback, sound, force and tactile feedback (i.e. reflection), smell and even taste." (JA23735) (emphasis added). Figure 19A of that patent clearly shows an interface for interaction, including input and output. (JA23726). The arrows between the computer and the sensing gloves clearly demonstrate two-way interaction and not just output. (JA23726). Particularly because Defendants did not move to exclude Dr. Rhyne's opinions regarding technical comparability, any perceived deficiencies in his technical comparability analysis should have been reserved for cross-examination.[7] *See*, *e.g.*, *Rembrandt Wireless Techs., LP v. Samsung Elecs. Co.*, No. 2:13-CV-213, 2015 U.S. Dist. LEXIS 20305, at &13-14 (E.D. Tex. Jan.

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[7] The district court also recognized that many issues related to expert opinion should be reserved for cross-examination. For example, in denying IVS' motions challenging Defendants' expert's reliance on four settlement agreements, so-called "telemetry data" spreadsheets, and the expert's failure to perform any calculations, the Order states that the issues raised by IVS "will be subjects for cross-examination." (JA19-20, JA25-26).

29, 2015); *Affinity Labs of Texas, LLC v. Ford Motor Co.*, Civil Action No. 1-12-CV-580, at 3-4 (E.D. Tex. Aug. 22, 2014) (JA23888-23889).

In addition, contrary to the Order's conclusion that "IVS' patented technology primarily functions as an input device, using facial recognition technology to acquire information about the player," both the District Court's *Markman* Order and the Defendants recognized that the '073 Patent discloses much more than an input device. (JA1977-2004) ('073 Patent "describes an entertainment apparatus, inclusive of video games and associated subsystems, that utilizes biometric facial recognition in order to facilitate end-user interaction, entertainment and enjoyment."); (JA961) ("The '073 Patent is directed to '[a]n articulated and animated toy capable of recognizing human users and selected inanimate objects and interacting therewith.'").

The Order also states that IVS argued "both technologies relate generally to an 'interface'…" (JA18). IVS actually argued that "[t]he Immersion patents and the '073 Patent are not just related to video games generally, but ***are related to a specific component of video games: user interaction*** . . . . Dr. Rhyne noted . . . the Immersion patents disclosed a 'man-machine *interface* which provides tactile feedback also known as 'haptic' feedback." (JA6176-6177) (citing (JA15278 at ¶ 313), Rhyne Opening Report (emphasis added)). "There was no requirement that the technology of the Immersion patents must be implemented in a traditional

video game controller … it can be a 'game controller' or 'mounted to a sensing

body part.'" (JA6176-6177). IVS further explained that "while it is true that both

the '073 Patent and the Immersion patents relate to video games, as Defendants

admit, they also both relate to *input/output interfaces used in video games*."

(JA6177) (emphasis added).

Beyond that, with the following two observations, the court below further

departed from being gatekeeper against unreliable principles and methods and

stepped into jury's the role of weighing evidence on disputes of degree of

relevance:

> [T]he Immersion/Sony technology was simply a modification of a handheld game controller, whereas the IVS' patented technology of facial recognition displaces the need for handheld game controllers, resulting in a fundamental change in game play.

> The fact that Mr. Bratic had to modify the royalty rate, based on the consideration that the Immersion/Sony technology was *less* valuable than the patented technology, is considerable evidence of the non-comparability of the Immersion/Sony technology.

(JA18).[8] Here too, Defendants and their expert should be free to argue about the

effect on the hypothetical negotiators of the relative differences in impact of the

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[8] Additional incorrect findings of fact and a failure to apply relevant law is apparent in the Order's finding that a challenged, alleged reference is statutory prior art. The Order, *inter alia*, failed to cite or analyze the demanding clear and convincing standard for prior art. (JA35-36). While IVS does not agree with the holding and intends to vigorously challenge it at the appropriate time, these issues do not affect the current final judgment in the instant matter, and thus it is IVS' understanding that they are not ripe for appeal.

technology, but it was a usurpation of the jury function, as well as illogical, for the court below to take the matter from jury consideration on the basis that recognition and analysis by IVS' experts of a value difference in effect amounts to a concession of no threshold comparability.

To the contrary, a recognition and analysis of value difference on its face evidences the very opposite. Actually, this Court <u>expects</u> that there will be some "technological and economic differences" between the past license and the infringement and, as such, has instructed that the comparison "must account" for them. *See Wordtech Sys. v. Integrated Networks Solutions, Inc.*, 609 F.3d 1308, 1320 (Fed. Cir. 2010); *see also Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1318 (Fed. Cir. 2014) (approving methodology where the expert "compared his resulting royalty to related licenses and rationalized the price differences").

Likewise, IVS' experts' recognition and analysis of value difference facially contradicts the assertions that IVS "ignor[ed] the [Immersion] patent's practice," "hid[] behind the language of the patent," "ignore[d] the role that the technological comparison plays within the license comparability analysis," and clamed "that a patent's disclosure could override the comparison between how the technology is practiced in considering license comparability." (JA17-18). That very recognition and analysis renders the exclusion of evidence relating to Immersion/Sony a clear error in judgment.

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2.   The Minimum Threshold Test for Technical Comparability

The district court misunderstood and misstated IVS' position regarding the standard for minimum comparability as, "once a technical expert opined as to the comparability of the technology, then the baseline test has been met," (JA15-16), thereby implying that IVS did not believe further review by a court was allowed. However, as stated in IVS' briefing, "any licenses relied upon to support a reasonable royalty analysis must be proven to be sufficiently comparable to the hypothetical license at issue."   (JA6174) (citing *Apple Inc. v. Motorola, Inc.*, 757 F.3d at 1315; *LucentTechs, Inc. v. Gateway, Inc.*, 580 F.3d at 1325).   At the hearing, IVS pointed out that the *evidence* supporting comparability was provided by the technical expert, Dr. Rhyne. (JA6649). IVS also agreed that comparability is not always a jury question, but pointed out that evidence in the form of a technical expert's opinion regarding technical comparability should be evaluated, particularly when that opinion is not subject to a *Daubert* challenge. (JA6650). The district court did not evaluate Dr. Rhyne's opinion on technical comparability.

The district court's statement that "[i]f a baseline of comparability could be established simply through a technical expert's opinion, then the court's role in determining whether the 'minimum threshold' had been met would be largely irrelevant" thus misses the point. (JA16). If a license does not mention the patent in suit, then there must be some "discernible link" between the comparable license

and the claimed technology. *See ResQNet.com, Inc. v. Lansa, Inc.*, 594 F.3d 860, 870 (Fed. Cir. 2010).   A technical expert's opinion routinely establishes this discernible link from a technical perspective because a damages expert usually lacks the background to opine on technical issues. *Apple Inc. v. Motorola, Inc.* 757 F.3d at 1321 ("Experts routinely rely upon other experts hired by the party they represent for expertise outside of their field.") (citations omitted); *Rembrandt*, 2015 U.S. Dist. LEXIS at *14. The methodology and principles used to identify the discernible link must be reliable, which is subject to review by the court, but factual issues such as differences in experts' technical assessments or conclusions go to the evidentiary weight, not admissibility, and may be addressed on cross-examination. *See Apple Inc. v. Motorola*, *Inc.*, 757 F.3d at 1319-21; Fed. R. Evid. 702; (JA7112-7113, JA6174-6176). IVS repeatedly cited *Apple Inc. v. Motorola, Inc.* in its briefing and relied on it at the hearing. (JA7113-7114, JA6707, JA6710, JA6174, JA6184-6186). The district court did not address it. (JA15).

3.   The   Sony/Immersion   License   is   Technologically Comparable and Should Not Be Excluded

The Order identifies three reasons for exclusion of the Sony/Immersion license and the related expert opinions and evidence. Its first reason was that IVS attempted "to shift focus away from how the Immersion patent was practiced as haptic feedback in the accused Sony game controllers, to simply the Immersion patent disclosure" and "ignor[ed] the patent's practice in the accused product."

(JA17). This is not true. Dr. Rhyne noted that the Immersion patents at issue in the Sony/Immersion litigation covered the use of the technology in the infringing Sony game system, which includes the Playstation Console, Playstation Dual-Shock Controller, and Playstation games. (JA15278-15280); *see also Immersion Corp. v. Sony Computer Entm't Am., Inc.*, No. C 02-0710, 2005 U.S. Dist. LEXIS 4777, *4-5 (N.D. Cal. Jan. 10, 2005); (Immersion litigation verdict) (JA23847-23862). Both the implementation of the technology and the Immersion patents themselves included interaction and more than haptic feedback in a controller. (JA15278-15280) The district court improperly credited Defendants' counsel's inaccurate arguments about the Immersion technology and Sony's implementation of it over the evidentiary record. (JA6689-6691).

For its second reason for exclusion, the district court found that the "Immersion/Sony technology is far from comparable to the patented technology" and relied on the unsupported findings of fact described above. (JA18). However, it is Dr. Rhyne's unchallenged opinion that the "infringing Sony technology addressed in the recent *Immersion v. Sony* judgment is the instance of a judgment or license I am aware of that, in my opinion, is most relevant and most comparable to the technology of the '073 Patent as embodied in the Xbox 360 and Xbox One Kinect Gaming Systems." (JA15278).

In contradiction to the district court's finding that IVS' technology is limited to an input device, the *Markman* Order states that the '073 Patent "describes an entertainment apparatus, inclusive of video games and associated subsystems, that utilizes biometric facial recognition in order to facilitate end-user interaction, entertainment and enjoyment." (JA1977-2004) In addition, Defendants admit that the '073 Patent "is directed to '[a]n articulated and animated toy capable of recognizing human users and selected inanimate objects and interacting therewith.'" (JA961)

In addition, the evidentiary record does not support the district court's finding that the Immersion technology is limited to an output device and the '073 Patent is limited to an input device. Dr. Rhyne explained that both technologies relate to entertainment systems with "man-machine interfaces" (JA15278) that "enhance game play [in video games and entertainment] by providing improvements related specifically to game control during play." (JA15277). The Order's incorrect and unsupported findings related to technical facts further illustrate why courts should not overstep their gate-keeping role and weigh facts. *See Apple Inc. v. Motorola, Inc.*, 757 F.3d at 1315.

The district court's third reason for exclusion was that "Mr. Bratic's use of the Immersion/Sony verdict and license as a comparable license belies his proposition that the two are comparable." (JA18). However, finding a difference

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in the relative value of two different patents or inventions does not mean they are not technically comparable. On the contrary, a comparison of value is not meaningful unless the patents or technologies are comparable, and the ultimate comparison based on such factors is usually left to the jury. *See ActiveVideo Networks, Inc. v. Verizon Communs., Inc.*, 694 F.3d 1312, 1333 (Fed. Cir. 2010) ("The degree of comparability of the … license agreements as well as any failure on the part of ActiveVideo's expert to control for certain variables are factual issues best addressed by cross examination and not by exclusion."); (JA6174-6176).

Furthermore, there is no requirement that only the *most* technologically comparable license may be considered by the jury. "That one approach may better account for one aspect of a royalty estimation does not make other approaches inadmissible … [t]he fact that one of these methods may be said to more accurately value this aspect of a reasonable royalty calculation does not, necessarily, make the other approach inadmissible." *Apple Inc. v. Motorola, Inc.*, 757 F.3d at 1315. In *Apple Inc. v. Motorola, Inc.* Apple's expert compared the technology and the relative values of different technologies. *Id.* at 1316-17. Prior licenses are almost never perfectly analogous to the infringement action, so an expert must account for relative differences. *See Ericsson, Inc. v. D-Link Sys.*, 773 F.3d 1201, 1227 (Fed. Cir. 2014) (citing *VirnetX*, 767 F.3d 1308, 1330 (Fed. Cir. 2014)). The

modification of a royalty rate based on the technologies' relative differences in value and importance is *not* considerable evidence of technical non-comparability, and the Order does not cite any case law to support its conclusion. (JA18).

The district court overstepped its gate-keeping role during its analysis of the admissibility of the Sony/Immersion license. The result is an order that makes erroneous findings of fact, improperly weighs and evaluates the correctness of expert conclusions, credits attorney argument over evidence, and imposes its own preferred methodology. *See Apple Inc. v. Motorola, Inc.*, 757 F.3d at 1314-15 (citing *Smith v. Ford Motor Co.*, 215 F.3d 713, 718 (7th Cir. 2000)); *see also Cavallo v. Star Enter.*, 100 F.3d 1150, 1158-59 (4th Cir. 1996) (Rule 702 was intended to liberalize the introduction of relevant expert evidence); *Alevromagiros v. Hechinger Co.*, 993 F.2d 417, 421 (4th Cir. 1993) (credibility of competing experts is a question for the jury).

B. Damages Experts May Consider a Party's Typical Format of Licenses to Form Their Opinions Regarding the Likely Form of Hypothetical Royalty

The Order also errs in excluding Mr. Bratic's opinion as to the form of royalty. (JA19). The Order relies on *TV Interactive Data Corp. v. Sony Corp.*, 929 F. Supp. 2d 1006 (N.D. Cal. 2013) and *Lucent* to support the conclusion that Mr. Bratic's reliance on thirteen Microsoft license agreements for technology used in the accused Xbox gaming system to inform the royalty *form* was improper. *Id.*

The Order first concludes that "the Federal Circuit has specifically rejected reliance on technologically non-comparable licenses under *Georgia-Pacific* Factor No. Two." (JA19) (citing *Lucent*, 580 F.3d at 1326-8).

Mr. Bratic's use of the agreements solely for the form of the royalty calculated under *Georgia-Pacific* Factor 2 is not a reason to exclude his opinion on form. As the Order recognizes, in *TV Interactive*, the expert testimony relating to technologically non-comparable licenses was determined improper because it was used to support the "royalty rate" (the amount of the percentage). (JA19). That is not the purpose of Mr. Bratic's reliance on these licenses. Also, unlike the *Lucent* case, there is evidence that the thirteen licenses are relevant because they are Microsoft licenses for components of the accused products, as Mr. Bratic explains in his report. (JA13808-13810); *compare Lucent*, 580 F.3d at 1327-30.

Mr. Bratic's report expressly states that he relies on these licenses only for the purpose of determining the form of royalty normally favored by Microsoft (an amount-per-unit royalty) for technology licenses for use in the accused Xbox gaming system. (JA11566-11567). Other courts have allowed such expert opinion in similar circumstances. *See Apple Inc. v. Samsung Elecs. Co. Ltd.*, No. 12-CV-00630, 2014 U.S. Dist. LEXIS 24506, at *53-54 (N.D. Cal. Feb. 25, 2014) ("As to the form of the reasonable royalty (lump-sum versus running royalty), Dr. Chevalier may continue to rely on her overall review of the license agreements in

the record."); *Paltalk Holdings, Inc. v. Microsoft Corp.*, No. 2:06-CV-367, 2009 U.S. Dist. LEXIS 131093, at *4-5 (E.D. Tex. Mar. 8, 2009)

Second, the Order concludes that "Mr. Bratic also incorrectly relied on thirteen Microsoft licenses to support the form of his royalty under *Georgia-Pacific* Factor No. Two." (JA19) However, Mr. Bratic's opinion as to the form of royalty was not solely based on these thirteen Microsoft agreements nor limited to his factor 2 analysis. (JA13880-13881). The *Georgia-Pacific* factors are neither rigid nor exclusive. *See Ericsson*, 773 F.3d at 1230; *Whitserve, LLC v. Computer Packages, Inc.*, 694 F.3d 10, 31-32 (Fed. Cir. 2012); *TWM Mfg. Co. v. Dura Corp.*, 789 F.2d 895, 899 (Fed. Cir. 1986); *Paltalk*, 2009 U.S. Dist LEXIS 131093, at *5; (JA6186-6187). Defendants never challenged Mr. Bratic's overall opinion as to the form of royalty in this case, and yet the Order excludes his opinions *in toto*. This was an abuse of discretion.

C.   Mr. Bratic Properly Apportioned

The Order acknowledges that "it is generally required that royalties be based not on the entire product, but instead on the smallest salable patent-practicing unit." (JA20) (quoting *LaserDynamics*, 694 F.3d at 67). It also acknowledges that "Mr. Bratic did apportion out those hardware components not required to practice the patented feature." (JA23). The Order finds this inadequate. However, the law

does not require apportionment to a level below the claimed invention. *See Astrazeneca*, 782 F.3d at 1338-39.

Illustrative of its various errors regarding the law of apportionment, the Order, in a footnote, states, "[t]he Court also notes that the Immersion/Sony verdict and royalty rate was set years before the Federal Circuit began requiring apportionment of damages, a fact which Mr. Bratic readily admitted. ECF No. 355, attach. 2 at 17." (JA17). That is wrong as a matter of both law and fact. Contrary to the district court's belief, "[t]he requirement that a patentee apportion his damages in every case to the value of the patented features is well over a century old." *In re Innovatio IP Ventures, LLC*, 2013 U.S. Dist. LEXIS 144061, *82-83, 2013 WL 5593609 (N.D. Ill. Sept. 27, 2013) (citing to *Garretson v. Clark*, 111 U.S. 120, 121 (1884); *LaserDynamics*, 694 F.3d 51, 67 (Fed. Cir. 2012)). This Court's decisions addressing apportionment routinely cite, directly or indirectly, to the Supreme Court's 1884 *Garretson* decision. *See*, *e.g.*, *Astrazeneca*, 782 F.3d at 1338; *Ericsson*, 773 F.3d at 1226; *LaserDynamics*, 694 F.3d at 67. Furthermore, in the deposition transcript cited by the district court, Mr. Bratic testified, "I agree that there have been recent cases where the federal circuit has talked about apportionment. But apportionment has always been required under *Georgia-Pacific*." (JA14072-14073).

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Mr. Bratic apportioned in exactly the way contemplated by *Astrazeneca*. The *Astrazeneca* defendants argued that the "district court should have calculated damages by apportioning the relative contribution of value between the active ingredient and the 'inventive element' of the patents, *i.e.*, the subcoating." *Astrazeneca*, 782 F.3d at 1337. This Court dismissed this argument and did not require apportionment to exclude the value of the drug core, a claimed element that was conventional. "It is not the case that the value of all conventional elements must be subtracted from the value of the patented invention as a whole when assessing damages." 782 F.3d at 1339; *see also id.* n.5 (citing *Univ. of Pittsburgh of the Commonwealth Sys. of Higher Educ. v. Varian Med. Sys.*, 561 Fed. Appx. 934, 947 (Fed. Cir. 2014) (non-precedential)).

The district court accepted the very invitation declined by this court in *Astrazeneca* and *Varian*. *See id.* n.5 (noting that the Court in *Varian* "declined the defendant's invitation to remove the conventional elements from the overall value of the combination apparatus."). The law of apportionment does not require subtraction of conventional claimed elements from the royalty base. The Order acknowledges that "Mr. Bratic did apportion out those hardware components not required to practice the patented feature," yet excludes Mr. Bratic's opinion based on an alleged need to further apportion to the value of one patented feature, facial recognition. (JA23). This is not required and is not a reason to exclude Mr.

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Bratic's apportionment analysis. *See Astrazeneca*, *782 F.3d at* 1338-39; *see also*

Apple Inc. v. Motorola, Inc., 757 F.3d at 1315-17.

The infringing units in this case are game systems, which include the Xbox

consoles, Kinects, and accused games, that constitute the infringing entertainment

apparatuses sold. Defendants do not separately sell the subcomponents of the

consoles or Kinects (such as the processor in the console). Because the console

and Kinect are multi-component products, Mr. Bratic apportioned the infringing

apparatuses, *i.e.*, reduced the royalty base, down to their respective components

with a close relation to the patented features, as required by the case law. *See*

VirnetX, 767 F.3d at 1329 (". . . a patentee must be reasonable (though may be

approximate) when seeking to identify a patent-practicing unit . . . with a close

relation to the patented feature . . .").

The *Astrazeneca* Court recognized that "while it is important to guard

against compensation for more than the added value attributable to an invention, it

is improper to assume that a conventional element cannot be rendered more

valuable by its use in combination with an invention." *Id*. at 1338. "The standard

Georgia-Pacific reasonable royalty analysis takes account of the importance of the

inventive contribution in determining the royalty rate that would have emerged

from the hypothetical negotiation." *Id*. It is the royalty rate, derived from the

overall *Georgia-Pacific* analysis, which accounts for the value attributable to the

inclusion of conventional elements in patent claims. *See id.* at 1338-39 & n.5.

Similarly, in *Varian*, this Court held that a beam generator was properly

included in the royalty base because it was a claimed albeit preexistent element,

reasoning:

> Claim 38 …uses open-ended language and explicitly includes the beam generator as a claimed component of the apparatus. As such, Varian's argument fails because ***Pitt is not attempting to include the value of unpatented features within its royalty base***. The beam generator is incorporated into the linear accelerator in claim 38; ***it is the combination apparatus that is claimed***.

561 Fed. Appx. at 947 (emphasis added). The Court further reasoned that a jury

could account for inclusion of an "unimproved conventional device" in the royalty

base (such as the claimed beam generator) by considering and applying the

Georgia-Pacific factors to reward the inventor only for the value of the invention.

Id. at 947-48; *see also Astrazeneca*, 782 F.3d at 1339 n.5.

In *Apple Inc. v. Motorola, Inc.*, this Court reversed exclusion of a damages

expert because the district court had relied on an incorrect claim construction,

failed to "consider the full scope of the claims" and instead erroneously "focused

on individual claim limitations in isolation," failed to consider "the full scope of

infringement," and "question[ed]… the factual underpinnings and correctness of

[the expert's] … testimony, rather than the reliability of his principles and method

and the sufficiency of the data upon which he relied." 757 F.3d at 1317-20. Under

Apple Inc. v. Motorola, Inc., a court must evaluate a damages expert's methodology "in view of the full scope of the infringed claims" instead of focusing on a single claimed limitation. *Id.* at 1318.

The Order ignores these principles and focuses on an individual claim element like the one the district court decision reversed in *Apple Inc. v. Motorola, Inc*. *See Apple Inc. v. Motorola, Inc.*, 757 F.3d at 1317-18. The asserted claims of the '073 Patent expressly recite an "entertainment apparatus" that includes an "entertainment device," an "acquisition device," a "processor," "memory," "toy" or "video game," and provision of "entertaining interaction." *See*, *e.g.*, '073 Patent claims 1, 2, 7, 11. (JA97). The Court's own claim construction states that the '073 Patent "describes an entertainment apparatus, inclusive of video games and associated subsystems that utilizes biometric facial recognition in order to facilitate end-user interaction, entertainment and enjoyment." (JA1977). As discussed in sections A(1) and A(3) above, the record evidence, including IVS's technical expert's opinion, shows the '073 Patent is not limited to "facial recognition" or "input" as the Order finds. (JA18, JA24). As in *Apple Inc. v. Motorola, Inc.*, the Order's "overly narrow view" of the patent claim scope impacts its entire damages analysis and renders it fatally flawed. *See Apple*, 757 F.3d at 1315-17 ("This error, alone, would require reversal and remand.").

The Order's misapprehension of the full patent claim scope clearly affects its analysis. For example, it ignores that the '073 Patent's claim elements expressly include, *inter alia*, a processor. (JA97) The Order acknowledges Mr. Bratic's apportionment to the patented features, but then concludes additional value apportionment was necessary. (JA23). It explains:

> Indeed, a processor has "several non-infringing features with no relation to the patented feature," *id.* [*VirnetX*] at 1327, yet Mr. Bratic attributed 100% of the processor to the apportioned royalty base. IVS could not plausibly argue that the processor does not have any other function besides practicing the patented feature, but that is exactly what Mr. Bratic's apportionment signifies. His failure to identify the value of those necessary hardware components renders his opinion flawed and directly contrary to the Federal Circuit's provision in *Virnetx*. Moreover, Mr. Bratic's value determination based on comparing the costs of the necessary hardware components to practice the patented technology and the total cost of the accused product also fails to properly consider the value of the patented feature. This calculation still ties the alleged "value" to the necessary hardware components, not the value of the patented feature. Under *Virnetx*, Mr. Bratic was barred from ascribing all of the value of the patented feature to a multi-component product like a processor.

(JA23). This is directly contrary to *Astrazeneca*, *Varian*, and *Apple Inc. v. Motorola, Inc.*, which hold that apportionment should take account of the full scope of the infringed claims, conventional elements claimed in a patent – such as the processor discussed by the Court – may be included in the royalty base, and the

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royalty rate can account for the relative value of non-infringing uses of claim elements.[9]

Another error in the Order is the unsupported factual assumption that the processor is a "multi-component product." (JA23). It cites no record support for that assumption.[10] The record was unequivocally to the contrary of the Order's conclusion that the processor is a multi-component product: Mr. Bratic and Dr. Rhyne both testified, and Defendants admitted, that one cannot purchase a partial CPU. (JA14078, JA15895, JA6215).[11] Moreover, even if this assumption has been factually supported, it would not follow that Mr. Bratic was required to

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[9] In contrast to Mr. Bratic's approach here, which involved a reduction in the royalty base, the plaintiff's expert in *VirnetX* identified the entire Apple iPhones and iPods as the "smallest salable units" and "used [as the royalty base] the base price at which each product was sold, excluding only charges for additional memory sold separately." *VirnetX*, 767 F.3d at 1328-29. He never apportioned from these "smallest salable units" and therefore "included various features indisputably not claimed by VirnetX" and "failed to apportion value between the patented features and the vast number of non-patented features contained in the accused products." *Id.* at 1329. This is why the methodology adopted by the VirnetX expert was unreliable.

[10] The Order cites to a webopedia webpage for its understanding of a "processor" instead of relying on any actual record evidence that relates to this case. (JA23).

[11] *Cf. Gaylord v. United States*, 777 F.3d 1363, 2015 U.S. App. LEXIS 1700, 19-20, 2015 WL 449192 (Fed. Cir. 2015) (rejecting a *VirnetX* challenge to damages based on the value of an entire stamp in a copyright case where "[t]he stamp consists, essentially in full, of the image of Mr. Gaylord's work and is not a multi-component product in a meaningful sense").

eliminate "conventional elements" of the processor from the royalty base. *See Astrazeneca*, 782 F.3d at 1338-39.

The Order applies language from *VirnetX* and *Uniloc* in order to reject IVS' argument that "once apportioned, the royalty rate itself accounts for the value of the patented feature." (JA24-25). However, once apportionment has taken place, the *Georgia-Pacific* factors serve to inform a conclusion regarding a royalty rate that is supposed to account for the value of the '073 Patent. *See Astrazeneca*, 782 F.3d at 1338; *see also Ericsson*, 773 F.3d at 1226 ("As we explained recently in *VirnetX…*, where multi-component products are involved, the governing rule is that ***the ultimate combination of royalty base and royalty rate must reflect the value*** attributable to the infringing features of the product, and no more.") (emphasis added) (citing *VirnetX*, 767 F.3d at 1326). If the royalty base must represent the "value" of the patented functionality, as the Order reasons, then there would be no need to determine and apply a royalty rate.[12]

The Order concludes, "Mr. Bratic did not use the royalty rate to account for the value of the patented feature within the accused product. Mr. Bratic increased his royalty rate based on an assumption that the patented technology was more

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[12] This Court has recognized that value can be estimated using a royalty rate *alone*, without royalty base apportionment, and that the bar on doing so (in cases where patented features do not drive demand for the entire product) is an "evidentiary" bar to prevent misleading jurors "who may be less equipped to understand the extent to which the royalty rate would need to do the work in such instances." *Ericsson*, 773 F.3d at 1227.

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valuable than the Immersion patents." (JA24). To the contrary, Mr. Bratic engaged in a complete *Georgia-Pacific* analysis to evaluate and determine the royalty rate and based his analysis in part on Dr. Rhyne's evaluation of the relative value and importance of the '073 Patent from a technical standpoint, not an "assumption." *Compare* (JA24) *to* (JA13873-13874) ("According to Dr. Rhyne, the patented technology taught by the '073 Patent is substantially more valuable … than the teachings of the Immersion Patents-in-Suit. Furthermore, according to Dr. Rhyne, the technology taught by the '073 Patent is at least several times more valuable than the technology taught by the Immersion Patents-in-Suit.").

The Order further errs in concluding that IVS "failed to apportion the royalty base by failing to apportion the value of the patented feature beyond his identification of the SSPPU," which conclusion is premised on rejecting a purported argument by IVS "that Mr. Bratic failed to apportion the value of the patented feature because Defendants did not provide adequate usage data." (JA24). First, IVS's patented features are not limited to facial recognition, as discussed in Sections A(1) and A(3) and above. (JA97). Second, IVS never argued below that absence of usage data impacted Mr. Bratic's ability to perform an apportionment analysis.[13]

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[13] Compare (JA22) (stating that IVS argued "that Mr. Bratic was prevented from apportioning the value of the patented feature because Defendants failed to provide adequate usage data"), (JA24) ("IVS' argument that Mr. Bratic failed to apportion the value of the patented feature because Defendants did not provide adequate usage data is meritless.").

While IVS raised Defendants' failure to provide usage data in the context of challenging the admissibility of certain Microsoft documents and Defendants' damages expert's reliance on them, IVS never contended that Microsoft's late production of those unauthenticated and unreliable documents impaired Mr. Bratic's ability to apportion. Mr. Bratic properly apportioned the royalty base down to the patented elements, and the Order should have allowed a jury to weigh Mr. Bratic's opinion and decide to what extent the value of the invention is reflected the accused products.

For all of the foregoing reasons, the Order also errs in granting Defendants' motions *in limine* 1-3. The Order does not provide any reasoning for granting those motions, which respectively sought to exclude evidence stemming from the Sony/Immersion litigation, references to the thirteen Microsoft licenses Mr. Bratic relied on to form his opinion about the form of royalty, and references to the "sales volume" of Defendants' accused products. With respect to the latter ruling, the fact that it encompasses not only the amount of sales in dollars but also the number of infringing sales of accused products compounds the error. The Order provides no legal basis to find that disclosing the number of infringing sales to the jury would be unduly prejudicial.

CONCLUSION

The District Court's order excluding Mr. Bratic and Dr. Rhyne's opinions regarding IVS' damages should be reversed and the judgment should be vacated. For all the reasons above, this Court should remand for a trial to determine whether Microsoft and/or Majesco infringe IVS' patent and, if so, the appropriate amount of damages.

Dated: June 29, 2015   Respectfully submitted,

                                   /s/ Michael K. Mutter

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ADDENDUM

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Addendum Page

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA**

NORFOLK DIVISION

FILED

MAR   4 2013

CLERK, U.S. DISTRICT COURT
NORFOLK. VA

INTELLIGENT VERIFICATION SYSTEMS, LLC,	)))
Plaintiff	))
v.	) Case No. 2:12CV525)
MICROSOFT CORPORATION, *et al.*	))
Defendants.	)))

STIPULATED PROTECTIVE ORDER

To expedite the flow of discovery materials, to facilitate the prompt resolution of disputes over confidentiality of discovery materials, to adequately protect information the parties are entitled to keep confidential, to ensure that only materials the parties are entitled to keep confidential are subject to such treatment, and to ensure that the parties are permitted reasonably necessary uses of such materials in preparation for and in the conduct of trial, pursuant to Fed. R. Civ. P. 26(c), it is HEREBY ORDERED THAT:

INFORMATION SUBJECT TO THIS ORDER

Discovery materials produced in this case may be labeled as one of four categories:

1. CONFIDENTIAL,

2. CONFIDENTIAL ATTORNEYS' EYES ONLY,

3. RESTRICTED CONFIDENTIAL – PROTECTED TECHNICAL, and

4. RESTRICTED CONFIDENTIAL - SOURCE CODE,

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as set forth in Items A-D below. All four of the identified categories of information shall be identified collectively in this Order by the title "Protected Information." Any documents derived from or containing "Protected Information" must also be designated with the appropriate category of confidentiality, according to the terms of this Order.

A.   Information Designated as Confidential Information

1.   For purposes of this Order, "CONFIDENTIAL INFORMATION" shall mean all information or material produced for or disclosed to a receiving party that a producing party, including any party to this action and any non-party producing information or material voluntarily or pursuant to a subpoena or a court order, considers to constitute or to contain trade secrets or other confidential research and development, technical, sales, marketing, financial, personnel, customer, vendor, or other commercial information, whether embodied in physical objects, documents, or the factual knowledge of persons, and which has been so designated by the producing party. Any CONFIDENTIAL INFORMATION obtained by any party from any person pursuant to discovery in this litigation may be used only for purposes of this litigation.

2.   Any document or tangible thing containing or including any CONFIDENTIAL INFORMATION may be designated as such by the producing party by marking it "CONFIDENTIAL" prior to or at the time copies are furnished to the receiving party.

3.   All CONFIDENTIAL INFORMATION not reduced to documentary, tangible or physical form or which cannot be conveniently designated as set forth in paragraph 2, shall be designated by the producing party by informing the receiving party of the designation in writing.

4.   Except as otherwise provided in paragraph 9, any documents (including physical objects) made available for inspection by counsel for the receiving party prior to producing copies of selected items shall initially be considered, as a whole, to constitute CONFIDENTIAL

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A TTORNEYS' EYES ONLY information and shall be subject to this Order. Thereafter, the

producing party shall have a reasonable time to review and designate the appropriate documents

as "CONFIDENTIAL," "CONFIDENTIAL ATTORNEYS' EYES ONLY," "RESTRICTED

CONFIDENTIAL – PROTECTED TECHNICAL," or "RESTRICTED CONFIDENTIAL -

SOURCE CODE" prior to furnishing copies to the receiving party.

5.   The following are non-exhaustive examples of information that is not

CONFIDENTIAL INFORMATION:

a. Published advertising materials;

b. Any information which is or, after its disclosure to a receiving party, becomes

part of the public domain as a result of publication not involving a violation of this Order;

c. Any information that the receiving party can show by written records was

already known to it prior to the disclosure, provided that it was either 1) received from the

producing party and was not received under an obligation of confidentiality to the producing

party, or 2) received from a source who obtained the information lawfully and under no

obligation of confidentiality to the producing party;

d. Any information which the receiving party can show by written records was

received by it after the disclosure from a source who obtained the information lawfully and under

no obligation of confidentiality to the producing party; and

e. Any information which the receiving party can show was independently

developed by it after the time of disclosure by personnel who did not have access to the

producing party's CONFIDENTIAL INFORMATION.

6.   Documents designated CONFIDENTIAL and information contained therein shall

be available only to:

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a. Persons who appear on the face of the Protected Information as an author, addressee, or recipient thereof;

b. Outside litigation counsel of record and supporting personnel employed in the law firm(s) of outside litigation counsel of record, such as attorneys, paralegals, legal translators, legal secretaries, legal clerks and shorthand reporters;

c. Technical advisers and their necessary support personnel, subject to the provisions of paragraphs 20-25 herein, and who have signed the form attached hereto as Attachment A;

d. Up to three (3) in-house counsel with responsibility for managing this litigation, up to three (3) employees in a party's legal department necessary to assist them in this litigation (i.e. clerical staff or paralegals), and up to three (3) employees of a party who either has responsibility for making decisions dealing directly with the litigation in this action or who is assisting outside counsel in preparation for proceedings in this action who have signed the form attached hereto as Attachment A;

e. The Court, its personnel and stenographic reporters (under seal or with other suitable precautions determined by the Court); and

f. Independent legal translators retained to translate in connection with this action; independent stenographic reporters and videographers retained to record and transcribe testimony in connection with this action;

g. Graphics, translation, or design services retained by counsel for purposes of preparing demonstrative or other exhibits for deposition, trial, or other court proceedings in the actions; non-technical jury or trial consulting services not including mock jurors who have signed the form attached hereto as Attachment A;

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h. Outside document processing service providers, including duplicating, photocopying, and document coding/scanning contractors; and

i. Such other persons as the parties may agree in writing, or by order of this Court.

B.   Information Designated Confidential Attorneys' Eyes Only

7.   The CONFIDENTIAL ATTORNEYS' EYES ONLY designation is reserved for CONFIDENTIAL INFORMATION that constitutes information within the scope of Rule 26(c)(1)(G) that is highly sensitive confidential information, including without limitation business or technical trade secrets and plans more sensitive or strategic than information designated CONFIDENTIAL, the disclosure of which is likely to harm that person's competitive position, or the disclosure of which would contravene an obligation of confidentiality to a third person or to a Court. In determining whether information should be designated as CONFIDENTIAL ATTORNEYS' EYES ONLY, each party agrees to use such designation only in good faith.

8.   Documents designated CONFIDENTIAL ATTORNEYS' EYES ONLY and information contained therein shall be available only to:

a. Persons who appear on the face of the Protected Information as an author, addressee, or recipient thereof;

b. Outside litigation counsel of record and supporting personnel employed in the law firm(s) of outside litigation counsel of record, such as attorneys, paralegals, legal translators, legal secretaries, legal clerks and shorthand reporters;

c. Technical advisers and their necessary support personnel, subject to the provisions of paragraphs 20-25 herein, and who have signed the form attached hereto as Attachment A;

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d. The Court, its personnel and stenographic reporters (under seal or with other suitable precautions determined by the Court); and

e. Independent legal translators retained to translate in connection with this action; independent stenographic reporters and videographers retained to record and transcribe testimony in connection with this action;

f. Graphics, translation, or design services retained by counsel for purposes of preparing demonstrative or other exhibits for deposition, trial, or other court proceedings in the actions; non-technical jury or trial consulting services not including mock jurors who have signed the form attached hereto as Attachment A.

g. Outside document processing service providers, including duplicating, photocopying, and document coding/scanning contractors; and such other persons as the parties may agree in writing, or by order of this Court.

C.   Information Designated Restricted Confidential - Protected Technical

9.   RESTRICTED CONFIDENTIAL-PROTECTED TECHNICAL designation is reserved for CONFIDENTIAL INFORMATION that constitutes highly sensitive technical information the disclosure of which would cause harm to the producing party's ability to protect its intellectual property. RESTRICTED CONFIDENTIAL-PROTECTED TECHNICAL designated materials and documents contain non-public, technical information (such as source code, system diagrams, flow charts, white papers, engineering specifications, research and development materials and the like) that is designated as such by the producing party at the time of production. The following documents and materials shall not be considered or classified as RESTRICTED CONFIDENTIAL-PROTECTED TECHNICAL materials: (i) publications, including patents and published patent applications; (ii) materials regarding third party systems

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or products that were publicly known, on sale, or in public use before January 27, 2000, unless such materials are designated as RESTRICTED CONFIDENTIAL-PROTECTED TECHNICAL materials by a third party; and (iii) information that is publicly available.

10.   Documents designated RESTRICTED CONFIDENTIAL-PROTECTED TECHNICAL and information contained therein shall be available only to:

a. Outside litigation counsel of record and supporting personnel employed in the law firm(s) of outside litigation counsel of record, such as attorneys, paralegals, legal translators, legal secretaries, legal clerks and shorthand reporters;

b. Technical advisers and their necessary support personnel, subject to the provisions of paragraphs 20-25herein, and who have signed the form attached hereto as Attachment A;

c. Up to two (2) in-house counsel with responsibility for managing this litigation.

d. The Court, its personnel and stenographic reporters (under seal or with other suitable precautions determined by the Court);

e. Independent legal translators retained to translate in connection with this action; independent stenographic reporters and videographers retained to record and transcribe testimony in connection with this action; and

f. Graphics, translation, or design services retained by counsel for purposes of preparing demonstrative or other exhibits for deposition, trial, or other court proceedings in the actions; non-technical jury or trial consulting services not including mock jurors who have signed the form attached hereto as Attachment A.

g. Outside document processing service providers, including duplicating, photocopying, and document coding/scanning contractors; and

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h. Such other persons as the parties may agree in writing, or by order of this

Court.

11.   Attorneys and patent agents under paragraphs 10(a) and 10(c), and technical

advisors under paragraph 10(b) upon reviewing any of an opposing party's RESTRICTED

CONFIDENTIAL-PROTECTED TECHNICAL or RESTRICTED CONFIDENTIAL-SOURCE

CODE materials shall not, for a period commencing upon receipt of such information and ending

six months following the conclusion of this case (including any appeals) engage in any

PROSECUTION ACTIVITY on behalf of a party asserting a patent in this case. Furthermore,

any person reviewing RESTRICTED CONFIDENTIAL-PROTECTED TECHNICAL materials

of another person shall not, for a period commencing upon receipt of such information and

ending one year following the date a party provides a certification of destruction or return of all

Protected Information (pursuant to paragraph 41 of this Protective Order) engage in any

PROSECUTION ACTIVITY involving claims on a method, apparatus or system for facial

recognition technology used to facilitate and/or enhance a user's interaction with a game,

entertainment device, or entertainment apparatus. PROSECUTION ACTIVITY shall mean:

(1) prepare and/or prosecute any patent application (or reissue thereof), whether design

or utility, and either in the United States or abroad on behalf of a patentee or assignee of

patentee's rights;

(2) prepare or otherwise aid in the drafting of patent claim(s) on behalf of a patentee or

assignee of patentee's rights;

(3) for a patent application (or reissue thereof) on behalf of the patentee or assignee of

patentee's rights, provide advice, counsel or suggestions regarding claim scope and/or

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language, embodiment(s) for claim coverage, claim(s) for prosecution, or products or processes for coverage by claim(s).

Nothing in this section shall be construed as preventing any attorney from challenging the validity or enforceability of any patent, including without limitation in proceedings in this court or reexamination or reissue proceedings in the United States or foreign patent offices. Nothing in this section shall be construed as preventing any attorney from working on any post-grant review proceedings where the patentee cannot broaden the scope of the claims. The parties expressly agree that the restrictions set forth herein shall be personal to any attorney who reviews reviewing RESTRICTED CONFIDENTIAL-PROTECTED TECHNICAL material and shall not be imputed to any other persons or attorneys at the attorneys' law firm or company. Moreover, the mere fact of a first attorney sending Prior Art to a second attorney, where the second attorney is involved in PROSECUTION ACTIVITY shall not be construed as involvement by the first attorney in PROSECUTION ACTIVITY. Prior Art for purposes of this Protective Order shall mean (i) publications, including patents and published patent applications; and (ii) materials or information regarding third party systems or products that were publicly known, on sale, or in public use before January 27, 2000, unless such materials are designated as RESTRICTED CONFIDENTIAL-PROTECTED TECHNICAL materials by a third party. Nothing in this provision shall prohibit an attorney of record in this litigation from discussing any aspect of this case that is reasonably necessary for the prosecution or defense of any claim or counterclaim in this litigation with his client.

D.   Information Designated Restricted Confidential - Source Code

12.   Documents or other things that are designated CONFIDENTIAL INFORMATION and contain a party's source code may be designated "RESTRICTED

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CONFIDENTIAL-SOURCE CODE", if they constitute confidential, proprietary and/or trade secret source code or object code. Other documents or things that include confidential, proprietary and/or trade secret source code or object code may be designated RESTRICTED CONFIDENTIAL - SOURCE CODE only if confidential, proprietary and/or trade secret source code or object cannot reasonably be segregated from the document or thing. The source code may be made available for review at a single secure site at the producing party's discretion, either (1) at the producing party's counsel's office or (2) at another single secure site selected by the Producing Party. The following conditions shall govern the production, review and use of source code information.

13.   Documents designated RESTRICTED CONFIDENTIAL – SOURCE CODE and information contained therein shall be available only to:

a. Outside litigation counsel of record and supporting personnel employed in the law firm(s) of outside litigation counsel of record, such as attorneys, paralegals, legal translators, legal secretaries, legal clerks and shorthand reporters;

b. Technical advisers and their necessary support personnel, subject to the provisions of paragraphs 20-25herein, and who have signed the form attached hereto as Attachment A;

c. The Court, its personnel and stenographic reporters (under seal or with other suitable precautions determined by the Court); and

d. Independent legal translators retained to translate in connection with this action; independent stenographic reporters and videographers retained to record and transcribe testimony in connection with this action;

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e. Graphics, translation, or design services retained by counsel for purposes of preparing demonstrative or other exhibits for deposition, trial, or other court proceedings in the actions; non-technical jury or trial consulting services not including mock jurors who have signed the form attached hereto as Attachment A; and.

f. Such other persons as the parties may agree in writing, or by order of this Court.

14.   All source code produced shall be deemed designated as "RESTRICTED CONFIDENTIAL-SOURCE CODE." All such source code, and any other Protected Information designated as "RESTRICTED CONFIDENTIAL-SOURCE CODE," shall be subject to the following provisions:

a. All source code will be made available for inspection in electronic (e.g. native) format at the office of the producing party's counsel located within the Eastern District of Virginia or Washington, D.C. by the producing party to the receiving party's outside counsel and/or technical advisers in a private room on a secured computer without Internet access or network access to other computers, as necessary and appropriate to prevent and protect against any unauthorized copying, transmission, removal or other transfer of any source code outside or away from the computer on which the source code is provided for inspection (the "Source Code Computer"). The computer containing source code will be made available for inspection during regular business hours, upon reasonable notice to the producing party, which shall not be less than 3 business days in advance of the requested inspection, and other days/or times, subject to the timely request by the Receiving Party, and subject to the Producing Party's availability and good faith efforts to accommodate the requested inspection. The requesting party shall provide the same notice prior to any additional inspections. The secure computers containing the complete source code must be sufficiently state-of-the-art (in terms of processor speed, memory,

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etc.) to support a review of the Electronic Format Source Code. The electronic format source code shall be made available for inspection in native format or in an electronically searchable form. Source code includes, but is not limited to, files in programming languages such as C++, Java, and Flash. If the Receiving Party believes any source code is missing from files made available for inspection by a Producing Party, it must meet and confer with the Producing Party. If a dispute remains after the meet and confer, the Receiving Party may request an order from the court directing the Producing Party to make available the scripts, compilers, assemblers, and other utilities necessary to rebuild the application from the source code, along with instructions for their use if the Court finds that source code is missing from the files made available for inspection. The producing party shall be obligated to install such tools or programs necessary to review and search the code produced on the platform produced. Upon providing adequate and reasonable notice, the receiving party shall be given access to the Source Code Computer during the pendency of this case, as requested.

b. Access to the Source Code Computer shall be permitted to outside counsel representing the receiving party and technical advisers retained by the receiving party. These individuals must be authorized to view "RESTRICTED CONFIDENTIAL – SOURCE CODE" materials under the terms of this Protective Order.

c. During any inspection, no recording devices (including cell phones, PDAs, or cameras) or recordable media will be permitted inside the source code review room. The receiving party's outside counsel and/or technical advisers shall be entitled to take notes relating to the source code that are reasonable necessary to facilitate review of the source code, but may not copy blocks of source code into the notes. Such notes shall be subject to the provisions of paragraph 14(h), below. The producing party may not inspect or review the notes of the

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reviewing party absent an order from the Court. No copies of all or any portion of the source code may leave the room in which the source code is inspected except as otherwise provided herein. Further, no other written or electronic record of the source code is permitted except as otherwise provided herein. The producing party may provide a person to monitor all entrances and exits from the source code viewing room. The producing party may visually monitor the activities of the receiving party's representatives (through a glass wall or window) during any source code review, but only to ensure that no unauthorized electronic records of the source code and that no information concerning the source code are being created electronically or transmitted electronically in any way, and only so long as the producing party cannot hear the receiving party or see the contents of the receiving party's notes or the display of the source code computer. The producing party may not use a video camera or other recording device to visually monitor the source code viewing room. The producing party may not enter the source code viewing room when the receiving party is present, without the receiving party's consent. Outside counsel for the Producing Party shall maintain an access log recording the identity of the outside counsel and/or technical advisers accessing the source code, and the time the access began and ended. The log shall not be admissible log and any information from it shall be inadmissible in this Litigation except in connection with proceedings before the Court regarding any alleged violations of this Protective Order.

d. The producing party shall supply and configure a dedicated, attached printer for use with the non-networked computer on which the source code is located. The receiving party may print a reasonable number of pages of source code, but only to the extent necessary to prepare court filings or pleadings or other papers (including a testifying expert's report or for use as a deposition exhibit). . The receiving party shall not print source code in order to review

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blocks of source code elsewhere in the first instance, i.e., as an alternative to reviewing that source code electronically on the Source Code Computer. The producing party will provide the requested material on watermarked paper bearing bates numbers and the legend "RESTRICTED CONFIDENTIAL – SOURCE CODE." At the time of review, the receiving party will provide to the producing party the copy of the source code printed by the receiving party in the source code viewing room. The producing party shall make a copy of the printed pages for the receiving for delivery to the receiving party within three (3) days. Each printed document shall indicate the full path and file name of the printed file, and each line of the source code listing shall be separately numbered.

e. If the producing party objects that certain portions of the printed source code is not reasonably necessary to facilitate the receiving party's furtherance of its claims and defenses in this case, the producing party shall make such objection known to the receiving party within three (3) business days specifying which printed page(s) are objectionable and the grounds for the objection. "Reasonably necessary" includes Printed portions that may be reasonably necessary to facilitate the receiving party's preparation of the case, including when reasonably necessary to prepare any filing with the Court or to serve any pleadings or discovery responses on any other party; to prepare internal work product materials; or to prepare other necessary case materials such as testifying expert reports, consulting expert written analyses, and related drafts and correspondences. Such consent shall not be withheld if the source code requested is reasonably necessary for use in preparing the Receiving Party's case. The Producing Party must use its power to object reasonably and may not, for example, make an objection simply to introduce delay or attempt to discover privileged information. If after meeting and conferring the producing party and the receiving party cannot resolve the objection, the producing party shall be

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entitled to seek a Court resolution of whether the printed source code in question is not reasonably necessary to any case preparation activity. The printed pages of source code determined to not be permissibly printed under this protective order shall be destroyed and outside counsel shall certify the destruction thereof.   The printed pages shall constitute part of the source code produced by the producing party in this action.

f. Unless otherwise agreed in advance by the parties in writing, following each inspection, the receiving party's outside counsel and/or technical advisers shall remove all notes, documents, laptops, and all other materials from the room that may contain work product and/or attorney-client privileged information. The producing party shall not be responsible for any items left in the room following each inspection session.

g. Other than as provided in paragraph 14(c) above, the receiving party will not copy, remove, or otherwise transfer any source code from the Source Code Computer including, without limitation, copying, removing, or transferring the source code onto any other computers or peripheral equipment. The receiving party will not transmit any source code in any way from the producing party's facilities or the offices of its outside counsel of record.

h. The receiving party shall maintain and store any paper copies of the source code or notes related to such source code (as referenced in paragraph 14(c)) at their offices in a manner that prevents duplication of or unauthorized access to the source code or notes, including, without limitation, storing the source code or notes in a locked room or cabinet at all times when it is not in use.

i. Any paper copies designated as "RESTRICTED CONFIDENTIAL – SOURCE CODE" shall be stored or viewed only at (i) the offices of outside counsel for the receiving party, (ii) the offices of technical advisers who have been approved to access source code under

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paragraphs 20-25; (iii) the site where any deposition is taken; (iv) the Court; or (v) any intermediate location necessary to transport the information to a hearing, trial or deposition. Any such paper copies shall be maintained at all times in a locked and secure location. The producing party shall not unreasonably deny a receiving party's request to make additional copies, providing that the request is for good cause and for use that otherwise complies with this order.

       j. Any printed pages of source code, and any other documents or things reflecting source code that have been designated by the producing party as "RESTRICTED CONFIDENTIAL – SOURCE CODE" may not be copied, digitally imaged, e-mailed, transmitted, uploaded, downloaded, photographed, or otherwise duplicated, except in limited excerpts necessary to attach as exhibits to court filings pursuant to paragraph (l).

       k. For depositions, the receiving party that wants to use any such materials at a deposition may make only as many copies, and only of the specific pages, as it intends to use at the deposition. Copies of source code that are marked as deposition exhibits shall not be provided to the Court Reporter or attached to deposition transcripts; rather, the deposition record will identify the exhibit by its production numbers.

       l. Images or copies of source code shall not be included in correspondence between the parties (references to production numbers shall be used instead), and shall be omitted from pleadings and other papers whenever possible. If a party reasonably believes that it needs to submit a portion of source code as part of a filing with the Court, such filing shall not include more than the source code reasonably necessary to support its filing, and the parties shall meet and confer as to how to make such a filing while protecting the confidentiality of the source code. If a producing party agrees to produce an electronic copy of all or any portion of its source code or provide written permission to the receiving party that an electronic copy or any other

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copy needs to be made for a Court filing, the receiving party's communications and/or disclosure of electronic files or other materials containing any portion of source code (paper or electronic) shall at all times be limited to solely individuals who are expressly authorized to view source code under the provisions of this Protective Order.

m. All paper copies shall be securely destroyed if they are no longer necessary in the litigation. At the conclusion of this action (including any appeals) and unless the Court provides otherwise, printed copies of source code shall be returned or destroyed pursuant to the terms of paragraph 41.

E.   Designating Materials

15. When a party wishes to designate its own "CONFIDENTIAL" or "HIGHLY CONFIDENTIAL" materials produced by someone other than the Designating Party, such designation shall be made:

a. Within seven (7) business days from the date that the Designating Party receives copies of such materials from the producing or disclosing entity; and

b. By notice to all parties to this action and to the Designating Party, if such party is not a party to this action, identifying the materials to be designated with particularity (either by production numbers or by providing other adequate identification of the specific material). Such notice shall be sent by facsimile and regular mail.

16.   Upon notice of designation in paragraph 15, all persons receiving notice of the requested designation of materials shall:

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a. Make no further disclosure of such Designated Material or information contained therein, except as allowed in this Stipulated Protective Order;

b. Take reasonable steps to notify any persons known to have possession or access to such Designated Materials of the effect of such designation under this Stipulated Protective Order; and

c. Take reasonable steps to reclaim or prevent access to such Designated Material or information in the possession or control of any person not permitted to have access under the terms of this Stipulated Protective Order.

17.   Deposition transcripts or portions thereof may be designated as CONFIDENTIAL, CONFIDENTIAL ATTORNEYS' EYES ONLY, RESTRICTED CONFIDENTIAL – PROTECTED TECHNICAL, and RESTRICTED CONFIDENTIAL - SOURCE CODE, by a party or Designating Party during deposition testimony taken in this action, in which case the portion of the transcript containing Designated Material shall be identified in the transcript by the Court Reporter as "CONFIDENTIAL," "CONFIDENTIAL ATTORNEYS' EYES ONLY," "RESTRICTED CONFIDENTIAL – PROTECTED TECHNICAL," or "RESTRICTED CONFIDENTIAL - SOURCE CODE." Where testimony is designated at a deposition, the Designating Party shall have the right to exclude at those portions of the deposition all persons not authorized by the terms of this Protective Order to receive such Protected Information.

18.   Any party may mark Protected Information as a deposition exhibit and examine any witness thereon, provided that the exhibit and related transcript pages receive the same confidentiality designation as the original Protected Information and provided that the person to

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whom the Protected Information is to be shown is a person who may have such access under this protective order.

19.   Any party or designating party may, within ten (10) business days after receiving a deposition transcript, designate pages of the transcript and/or its exhibits as Protected Information. If any party or designating party so designates such material, the parties or deponents shall provide written notice of such designation to all parties within the ten day period. Protected Information within the deposition transcript or the exhibits thereto may be identified in writing or by underlining the relevant portions and marking such portions "CONFIDENTIAL," "CONFIDENTIAL ATTORNEYS' EYES ONLY," "RESTRICTED CONFIDENTIAL – PROTECTED TECHNICAL," or "RESTRICTED CONFIDENTIAL - SOURCE CODE." Until the expiration of the ten business-day period, any portion of the deposition not previously designated shall be treated as "CONFIDENTIAL ATTORNEYS' EYES ONLY" and subject to protection as provided by this Protective Order.

DISCLOSURE OF TECHNICAL ADVISERS

20.   Information designated by the producing party under any category of Protected Information and such copies of this information as are reasonably necessary to facilitate the receiving party's furtherance of its claims or defenses in this case may be furnished and disclosed to the receiving party's technical advisers and their necessary support personnel. The term "technical adviser" shall mean an independent, outside expert witness or consultant with whom counsel may deem it appropriate to consult and whom complies with paragraph 21.

21.   No disclosure of Protected Information to a technical adviser or their necessary support personnel shall occur until that person has signed the form attached hereto as Attachment

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A, and a signed copy has been provided to the producing party; and to the extent there has been an objection under paragraph 23, that objection is resolved as discussed below.

22.   A party desiring to disclose Protected Information to a technical adviser shall also give prior written notice to the producing party, who shall have seven (7) business days after such notice is given to object in writing. The party desiring to disclose Protected Information to a technical adviser must provide the following information for each technical adviser: name, address, curriculum vitae, current employer and employment history, including consulting relationships and a listing of cases in which the witness has testified as an expert at trial or by deposition, within the preceding four (4) years. No Protected Information shall be disclosed to such expert(s) or consultant(s) until after the expiration of the foregoing notice period.

23.   A party objecting to disclosure of Protected Information to a technical adviser shall state with particularity the ground(s) of the objection and the specific categories of documents that are the subject of the objection. The objecting party's consent to the disclosure of Protected Information to a technical adviser shall not be unreasonably withheld. Its objection must be based on that party's good faith belief that disclosure of its Protected Information to the technical adviser will result in specific business or economic harm to that party, and the objection must describe with particularity why that party believes disclosure of the Protected Information will result in harm to that party.

24.   If after consideration of the objection, the party desiring to disclose the Protected Information to a technical adviser refuses to withdraw the technical adviser, that party shall provide notice to the objecting party. Thereafter, the objecting party shall move the Court, within seven (7) business days of receiving such notice, for a ruling on its objection. A failure to file a motion within the seven (7) business day period shall operate as an approval of disclosure of the

Protected Information to the technical adviser. The parties agree to cooperate in good faith to shorten the time frames set forth in this paragraph if necessary to abide by any discovery or briefing schedules.

25.   The objecting party shall have the burden of showing to the Court good cause for preventing the disclosure of its Protected Information to the technical adviser. This showing shall include a particularized showing that: (1) the Protected Information is confidential commercial information, (2) disclosure of the Protected Information would result in a clearly defined and serious injury to the objecting party's business, and (3) there is a substantial risk of competitive harm if the proposed technical advisor is allowed access to the Protected Information.

CHALLENGES TO CONFIDENTIALITY DESIGNATIONS

26.   The parties shall use reasonable care when designating documents or information as Protected Information. Nothing in this Order shall prevent a receiving party from contending that any documents or information designated as Protected Information have been improperly designated. A receiving party may at any time request that the producing party cancel or modify the Protected Information designation with respect to any document or information contained therein.

27.   A party shall not be obligated to challenge the propriety of a designation of any category of Protected Information at the time of production, and a failure to do so shall not preclude a subsequent challenge thereto. Such a challenge shall be written, shall be served on counsel for the producing party, and shall particularly identify the documents or information that the receiving party contends should be differently designated. The parties shall use their best efforts to resolve promptly and informally such disputes. If an agreement cannot be reached, the receiving party shall request that the Court cancel or modify a designation. The burden of

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demonstrating the confidential nature of any information shall at all times be and remain on the designating party.

28.   Until a determination by the Court, the information in issue shall be treated as having been properly designated and subject to the terms of this Order.

LIMITATIONS ON THE USE OF PROTECTED INFORMATION

29.   All Protected Information shall be held in confidence by each person to whom it is disclosed, shall be used only for purposes of this litigation, shall not be used for any business purpose, and shall not be disclosed to any person who is not entitled to receive such information as herein provided. All produced Protected Information shall be carefully maintained so as to preclude access by persons who are not entitled to receive such information.

30.   Except as may be otherwise ordered by the Court, any person may be examined as a witness at depositions and trial and may testify concerning all Protected Information of which such person has prior knowledge. Without in any way limiting the generality of the foregoing:

a. A present or former director, officer, employee of a producing party, may be examined and may testify at deposition or trial concerning all Protected Information which has been produced by that party and either (1) identifies on its face the director, officer, and/or employee as an author or recipient, (2) concerns a subject matter of which the director, officer and/or employee has knowledge or (3) concerns a topic about which said director, officer, and/or employee has been identified or designated to testify regarding.

b. A technical adviser of a producing party who complies with paragraphs 20- 25of this Order may be examined and may testify at deposition or trial concerning all Protected Information which has been produced by that party.

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c. Non-parties may be examined or testify at deposition or trial concerning any document containing Protected Information of a producing party which appears on its face or from other documents or testimony to have been received from or communicated to the nonparty as a result of any contact or relationship with the producing party or a representative of the producing party, but may not retain originals or copies of such Protected Information or any notes or transcripts reflecting such Protected Information, other than for the limited period of time necessary to review any deposition transcripts and make corrections. Any person other than the witness, his or her attorney(s), or any person qualified to receive Protected Information under this Order shall be excluded from the portion of the examination concerning such information, unless the producing party consents to persons other than qualified recipients being present at the examination. If the witness is represented by an attorney who is not qualified under this Order to receive such information, then prior to the examination, the producing party shall request that the attorney provide a signed statement, in the form of Attachment A hereto, that he or she will comply with the terms of this Order and maintain the confidentiality of Protected Information disclosed during the course of the examination. In the event that such attorney declines to sign such a statement prior to the examination, the parties, by their attorneys, shall jointly seek a protective order from the Court prohibiting the attorney from disclosing Protected Information.

USE OF PROTECTED INFORMATION IN FILINGS WITH THE COURT

31.   To the extent that any Protected Information (or any pleading, motion, or memorandum referring to them) are proposed to be filed or are filed with the Court by a party (the "filing party"), those materials and papers, or any portion thereof which discloses confidential information, shall be filed under seal by the party claiming confidentiality of the material ("designating party") with the Clerk of the Court in an envelope marked "SEALED

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PURSUANT TO STIPULATION AND CONFIDENTIALITY AGREEMENT DATED

_____," together with a simultaneous motion to retain the filed document under seal

(hereinafter " Sealing Motion") pursuant to Local Civil Rule 5 and other applicable laws and

rules.

a. If the filing party and designating party are different, the filing party shall

inform the designating party of the filing party's intent to use Protected Information at least

seventy-two (72) hours prior to filing along with specific identification of the Protected

Information.

b. Even if the filing party believes that the material designated as Protected

Information are not properly classified as Protected Information, the filing party shall permit the

designating party to file the Sealing Motion; provided, however, that the filing of the Sealing

Motion shall be wholly without prejudice to the filing party's rights under paragraphs 26-28.

32.   Outside attorneys of record for the parties are hereby authorized to be the persons

who may retrieve confidential exhibits and/or other confidential matters filed with the Court

upon termination of this litigation without further order of this Court, and are the persons to

whom such confidential exhibits or other confidential matters may be returned by the Clerk of

the Court, if they are not so retrieved. No material or copies thereof so filed shall be released

except by order of the Court, to outside counsel of record, or as otherwise provided for

hereunder. Notwithstanding the foregoing and with regard to material designated as

RESTRICTED CONFIDENTIAL-SOURCE CODE, the provisions of Section D are controlling

to the extent those provisions differ from this paragraph.

33.   Protected Information shall not be copied or otherwise produced by a receiving

party, except for transmission to qualified recipients, without the written permission of the

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producing party, or, in the alternative, by further order of the Court. Nothing herein shall, however, restrict a qualified recipient from making working copies, abstracts, digests and analyses of Protected Information for use in connection with this litigation and such working copies, abstracts, digests and analyses shall be deemed Protected Information under the terms of this Order. Further, nothing herein shall restrict a qualified recipient from converting or translating Protected Information other than RESTRICTED CONFIDENTIAL—SOURCE CODE material into machine readable form for incorporation into a data retrieval system used in connection with this action, provided that access to that Protected Information, in whatever form stored or reproduced, shall be limited to qualified recipients.

34.   At the request of any party, the original and all copies of any deposition transcript, in whole or in part, shall be marked "CONFIDENTIAL," "CONFIDENTIAL ATTORNEYS' EYES ONLY," "RESTRICTED CONFIDENTIAL-PROTECTED TECHNICAL" and/or "RESTRICTED CONFIDENTIAL-SOURCE CODE" by the reporter. This Request may be made orally during the deposition or in writing within fifteen (15) days of the final certified transcript. Deposition transcripts shall be treated as CONFIDENTIAL ATTORNEYS' EYES ONLY until the expiration of the time to make a confidentiality designation. Any portions so designated shall thereafter be treated in accordance with the terms of this Order.

35.   Where Protected Information is used at trial, it is the burden of the Designating Party whose documents or materials are being used to make arrangements with the Court to ensure that its Protected Information remains confidential; however, where Protected Information is to be used at trial by a party other than the Designating Party, the Designating Party must be notified at least 10 days before trial, so that the Designating Party is able to make arrangements with the Court to ensure that its Protected Information remains confidential.

NONPARTY USE OF THIS PROTECTIVE ORDER

36.   A nonparty producing information or material voluntarily or pursuant to a subpoena or a court order may designate such material or information as Protected Information pursuant to the terms of this Protective Order.

37.   A nonparty's use of this Protective Order to protect its Protected Information does not entitle that nonparty access to the Protected Information produced by any party in this case.

NO WAIVER OF PRIVILEGE

38.   Nothing in this Protective Order shall require production of information that a party contends is protected from disclosure by the attorney-client privilege, the work product immunity or other privilege, doctrine, right, or immunity. Federal Rule of Evidence 502 shall apply to this case. The production or disclosure during discovery of an attorney-client privileged, attorney work product, or other protected document or information medium ("Protected Material") shall not be deemed a waiver of the privilege, work product, or other protection or immunity from discovery by the producing party in this or any subsequent state or federal proceeding if the producing party took reasonable steps to prevent disclosure and also took reasonable steps to rectify the error in the event of inadvertent disclosure. The producing party will be deemed to have taken reasonable steps to prevent communications or information from inadvertent disclosure if the producing party utilized attorney review, keyword search term screening, and/or linguistic tools in screening for privilege, work product or other protection. In the event of the inadvertent disclosure of confidential material, the producing party shall be deemed to have taken reasonable steps to rectify the error of disclosure if, within (5) calendar days from the date that the inadvertent disclosure has been realized, the producing party notifies the receiving party of the inadvertent disclosure. If any party becomes aware of the production

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of Protected Material by any party, the party shall provide prompt written notice of such production. Within five (5) business days of receipt of notice by any party that Protected Material was produced or disclosed, sufficiently identified by Bates number or other method to enable its identification, all recipients of the Protected Material shall collect all copies or reproductions thereof and either segregate them to protect them from use, or, if requested, return them to the producing party and shall delete such material from any medium. In addition, the recipients shall collect all notes or other work product that summarize, discuss, or quote the contents of such Protected Material, which shall then be segregated and destroyed, unless the protected nature of the production is disputed. Nothing herein shall prevent the receiving party from challenging the propriety of the attorney-client, work product or other designation of protection. If the recipient disputes the protected nature of the Protected Material, then the recipient shall so notify the producing party in writing at the time the documents, information, and materials are segregated or returned to the producing party, or within a reasonable time thereafter. If the dispute cannot be resolved after conferring in good faith with the producing party, the recipient may promptly file a motion with the Court to compel production of such documents, information, and materials, attaching the information at issue, under seal. The producing party shall have the burden of demonstrating the protected nature of the Protected Material. The producing party must retain the information until the claim is resolved. If the protected nature of the Protected Material is upheld, the receiving party shall return or destroy the Protected Material and all notes or other work product that summarize, discuss, or quote the contents of the Protected Material. Notwithstanding this provision, no person is required to delete information that may reside on the respective person's electronic backup systems that are over-written in the normal course of business. The protections against waiver afforded by the

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Order shall be applicable to the fullest extent allowed by Rule 502 of the Federal Rules of Evidence against both Parties and non-Parties to this action and in other proceedings in Federal and State courts.

39.   Privilege Log: The parties have agreed that should any documents be withheld from production on the basis that they are privileged; the withholding party shall produce a privilege log in accordance with the following conditions:

(a)   Communications with outside counsel after the date the Complaint was served in this action may be excluded;

(b)   Communications with in-house counsel after the date the Complaint was served in this action may be excluded so long as the in-house counsel was acting in a legal capacity and not in a capacity whereby they were providing business advice to their employer;

(c)   The privilege log must conform to Federal and Eastern District of Virginia practice, and include sufficient descriptive information that supports the privilege asserted to enable the receiving party to make a determination whether to challenge the assertion of privilege.

MISCELLANEOUS PROVISIONS

40.   Any of the notice requirements herein may be waived, in whole or in part, but only in writing signed by an outside counsel of record for the party against whom such waiver will be effective.

41.   Inadvertent or unintentional production of documents or things containing Protected Information which are not designated as one or more of the four categories of Protected Information at the time of production shall not be deemed a waiver in whole or in part

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of a claim for confidential treatment. The producing party shall notify the receiving parties promptly after the discovery of the error in writing and, with respect to documents, provide replacement pages bearing the appropriate confidentiality legend. In the event of any unintentional or inadvertent disclosure of Protected Information other than in a manner authorized by this Protective Order, counsel for the party responsible for the disclosure shall immediately notify opposing counsel of all of the pertinent facts, and make every effort to further prevent unauthorized disclosure including, retrieving all copies of the Protected Information from the recipient(s) thereof, and securing the agreement of the recipients not to further disseminate the Protected Information in any form. Compliance with the foregoing shall not prevent the producing party from seeking further relief from the Court.

42.   Within sixty (60) days after the entry of a final non-appealable judgment or order, or the complete settlement of all claims asserted against all parties in this action, each party shall, at the option of the receiving party, either return or destroy all physical objects and documents which embody Protected Information it has received, and shall destroy in whatever form stored or reproduced, all physical objects and documents, including but not limited to, correspondence, memoranda, notes and other work product materials, which contain or refer to any category of Protected Information. All Protected Information, not embodied in physical objects and documents shall remain subject to this Order. Notwithstanding this provision, no person is required to delete information that may reside on the respective person's electronic back-up systems that are over-written in the normal course of business. Notwithstanding the foregoing, outside counsel shall be entitled to maintain copies of all correspondence, pleadings, motions and trial briefs (including all supporting and opposing papers and exhibits thereto), written discovery requests and responses (and exhibits thereto), deposition transcripts (and exhibits thereto), trial

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transcripts, and exhibits offered or introduced into evidence at any hearing or trial, and their attorney work product which refers or is related to any CONFIDENTIAL and CONFIDENTIAL ATTORNEYS' EYES ONLY information for archival purposes only, except such outside counsel shall not retain any RESTRICTED CONFIDENTIAL-PROTECTED TECHNICAL or RESTRICTED CONFIDENTIAL-SOURCE CODE materials. If a party destroys Protected Information, the destruction must be by means satisfactory to the producing party, and the party must provide a Certificate of Destruction to the producing party.

43.   If at any time documents containing Protected Information are subpoenaed by any court, arbitral, administrative or legislative body, the person to whom the subpoena or other request is directed shall immediately give written notice thereof to every party who has produced such documents and to its counsel and shall provide each such party with an opportunity to object to the production of such documents. If a producing party does not take steps to prevent disclosure of such documents within ten (10) business days of the date written notice is given, the party to whom the referenced subpoena is directed may produce such documents in response thereto.
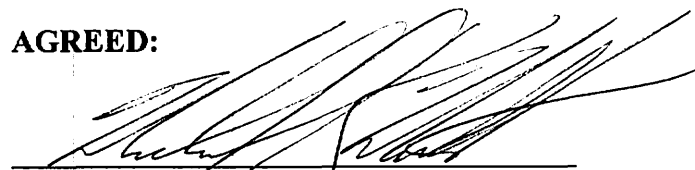
44.   This Order is entered without prejudice to the right of any party to apply to the Court at any time for additional protection, or to relax or rescind the restrictions of this Order, when convenience or necessity requires. Furthermore, without application to this Court, any party that is a beneficiary of the protections of this Order may enter a written agreement releasing any other party hereto from one or more requirements of this Order even if the conduct subject to the release would otherwise violate the terms herein.

45.   Nothing in this Order shall restrict any party to this lawsuit or its attorneys from disclosing or using, in any manner and for any purpose, its own Protected Information.

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46.   After termination of this litigation, the provisions of this Agreed Protective Order shall continue to be binding except with respect to those documents and information that become a matter of public record. This Court retains and shall have continuing jurisdiction over the parties and recipients of the Protected Information for enforcement of the provision of this Agreed Protective Order following termination of this litigation. All disputes concerning Protected Information produced under the protection of this Agreed Protective Order shall be resolved by the United States District Court for the Easter District of Virginia, Norfolk Division.

47.   Document discovery concerning testifying experts shall be limited to the final versions of their expert reports, materials relied upon, and their invoices for work performed. Testifying experts' draft reports, notes, and communications with counsel will not be subject to document discovery, except to the extent relied upon by the expert in the final version of his or her report(s). The foregoing does not restrict discovery by oral deposition, and does not obligate any party to retain draft reports.
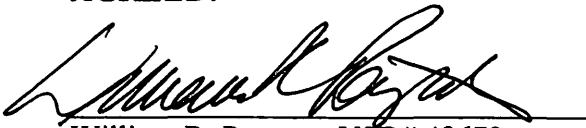
AGREED:

_____

Michael K. Mutter, VSB# 21172
Robert J. Kenney, VSB# 27668
Quentin R. ("Rick") Corrie, VSB# 14140
Michael B. Marion, VSB #77025
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AGREED:

_____

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AGREED:

_____

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wpoynter@williamsmullen.com
ATTORNEYS FOR DEFENDANT
MAJESCO ENTERTAINMENT CO.

It is so ORDERED.

Entered this __4th__ day of __March__, 2013.

_____

United States Magistrate Judge
United States District Court
Eastern District of Virginia

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ATTACHMENT A

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA

NORFOLK DIVISION

INTELLIGENT VERIFICATION SYSTEMS, LLC,	)))	
Plaintiff	))	
v.	))	Case No. 2:12-cv-00525-AWA-LRL
MICROSOFT CORPORATION, *et al.*	))	
Defendants.	)))	

PROTECTIVE ORDER UNDERTAKING

I reside at _____ .

My present employer is _____ .

1.   My present occupation or job description is _____ .

2.   I have read the Agreed Protective Order dated

_____ and have been engaged as _____

on behalf of _____ in connection with the litigation styled

Intelligent Verification Systems, LLC v. Microsoft Corporation, et al.

3.   I am fully familiar with and agree to comply with and be bound by the provisions

of said Order. I understand that I am to retain all copies of any documents designated as

CONFIDENTIAL, CONFIDENTIAL ATTORNEYS' EYES ONLY, RESTRICTED

CONFIDENTIAL-PROTECTED TECHNICAL and/or RESTRICTED CONFIDENTIAL-

SOURCE CODE information in a secure manner, and that all copies are to remain in my

personal custody until I have completed my assigned duties, whereupon the copies and any writings prepared by me containing any CONFIDENTIAL information are to be returned to counsel who provided me with such material or destroyed as directed by such counsel.

4.   I will not divulge to persons other than those specifically authorized by said Order, and will not copy or use except solely for the purpose of this action, any information obtained pursuant to said Order, except as provided in said Order. I also agree to notify any stenographic or clerical personnel who are required to assist me of the terms of said Order.

5.   I state under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on _____, 2013.

_____

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IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
NORFOLK DIVISION

INTELLIGENT VERIFICATION SYSTEMS, LLC,	)))	
Plaintiff	))	
v.	))	Case No. 2:12CV525
MICROSOFT CORPORATION, *et al.*	))	
Defendants.	))	

ORDER GOVERNING THE PRODUCTION OF
ELECTRONICALLY STORED INFORMATION (ESI)

Upon consideration of the parties' submissions and proposals to govern the production of

electronically stored information ("ESI"), for good cause shown, it is hereby

ORDERED that the following procedures govern the production of ESI:

1. On or before **April 17, 2013,** each party shall disclose:

    a. The custodians most likely to have discoverable information in their possession,

    custody or control. The custodians shall be identified by name, title, and the

    expected subject matter of the information; and

    b. A list of the non-custodial data sources that are most likely to contain non-

    duplicative discoverable information for preservation and production

    consideration;

    c. Identification of any ESI (by type, date, custodian, electronic system or other

criteria) that a party asserts is not reasonably accessible under Fed. R. Civ. P.

26(b)(2)(B); and

    d. Identification of any issues related to production of information subject to privacy

protections, including information that may need to be produced from outside of

the United States and subject to foreign laws.

2. **On-site inspection of electronic media.** Such an inspection shall not be permitted

absent a demonstration by the requesting party of specific need and good cause.

3. **Search methodology.** If the producing party elects to use search terms to locate some or

all potentially responsive ESI, the producing party shall disclose which portion of its ESI

production the producing party will employ the use of search terms, and utilize one of the

following methodologies, as selected by the producing party:

    a. The parties shall negotiate in good faith to agree upon a list of keyword search

terms to be used based upon statistically valid samples of proposed search terms

or term phrases with a 95% confidence interval and 5% confidence level. The

results of these statistically valid samples shall form the basis of the parties'

negotiations, taking into account the proportionality principles in Federal Rule of

Civil Procedure 26. Focused terms, rather than over-broad terms (e.g., product

and company names), shall be employed. The producing party shall search (i) the

non-custodial data sources identified in accordance with paragraph 1(a)(ii); and

(ii) emails and other ESI maintained by the custodians identified in accordance

with paragraph 1(a)(i). The use of this methodology does not supersede the

producing party's obligation to timely produce documents under the Federal

Rules of Civil Procedure, and the producing party shall timely produce responsive documents identified from the results of the agreed-upon keyword term search. The producing party's production of documents under this methodology does not preclude further negotiations of keyword search terms as discovery progresses in this matter.

b. The producing party shall disclose the search terms used to locate potentially responsive ESI to the requesting party. The requesting party may seek, through Requests for Production, additional search terms to be used in connection with the electronic search, in accordance with the procedures for production of documents under the Federal Rules and this Order. Focused terms, rather than over-broad terms (e.g., product and company names), shall be employed. The producing party shall search (i) the non-custodial data sources identified in accordance with paragraph 1(a)(ii); and (ii) emails and other ESI maintained by the custodians identified in accordance with paragraph 1(a)(i).

4. **Production.** ESI shall be produced as follows:

a. single-page TIFF format files imaged to at least 300 dpi, with each image endorsed with a bates number;

b. load files that map to all of the TIFF images and depict the document boundaries and attachment (parent/child) relationships and;

c. data load files which contain extracted text and available metadata fields corresponding to those listed below (to the extent such fields exist and are available):

Metadata Fields	Description
BegDoc#	The bates label of the first page of the document
EndDoc#	The bates label of the last page of the document
To	The recipient of the document or email
From	The author of the document or email
CC	Persons copied on the document or email
BCC	The persons blind-copied on the document or email
Custodian	The person who maintains custody of the document or email
Date Created	Document date or date email was created
Date Sent	Date document or email was sent
Date Received	Date document or email received by recipient
Date Last Modified	Date last modified for attachments and standalone electronic files
Email Subject	Subject of email
Doc Title	Title of document
File Name	File name of electronic document
File Path	File path as maintained by operating system
Folder	Email folder information
Attachment ID	Bates range of document or email attachment
Parent ID	Bates range of parent document or email

　　d. Documents originally maintained in paper or other non-electronic format and

　　　documents not searchable in their native format shall be produced as TIFF files

　　　with their contents in a TXT file using optical character recognition (OCR) and a

load file that maps the TXT file to the corresponding TIFF file. Any redacted or privileged material should be labeled clearly to show the redactions.

e. For files that cannot readily be converted to TIFF format or that reasonably require access to the native file, including but not limited to all spreadsheets (*e.g.* Excel files), presentations (*e.g.* PowerPoint files), database files, graphics, audio files, video files, and animations, shall be produced in native format with all metadata intact (and not as a TXT file).

/s/

Lawrence R. Leonard
United States Magistrate Judge
~~UNITED STATES DISTRICT JUDGE~~

AGREED:

/s/ Michael K. Mutter
Michael K. Mutter, VSB# 21172
Robert J. Kenney, VSB# 27668
Quentin R. ("Rick") Corrie, VSB# 14140
Michael B. Marion, VSB #77025
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INTELLIGENT VERIFICATION SYSTEMS, LLC

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MICROSOFT CORPORATION

AGREED:

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John B. Swingle, VSB# 82704
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ATTORNEYS FOR DEFENDANT
MAJESCO ENTERTAINMENT CO.

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
NORFOLK DIVISION
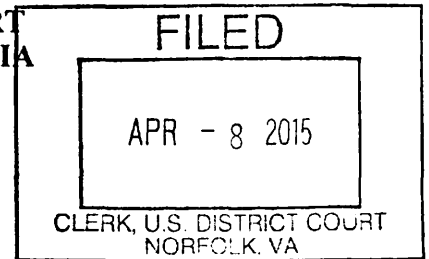
INTELLIGENT VERIFICATION
SYSTEMS, LLC,

                Plaintiffs,

    v.

MICROSOFT CORPORATION, and
MAJESCO ENTERTAINMENT CO.,

                Defendants.

FILED

APR - 8 2015

CLERK, U.S. DISTRICT COURT
NORFOLK, VA

Civil Action No. 2:12-cv-525-AWA-LRL

ORDER GRANTING
SUMMARY JUDGMENT AND DISMISSAL

This matter is before the Court on the Defendants' Unopposed Motion for Entry of

Summary Judgment and Dismissal ("Motion").

For good cause having been shown, the Motion is hereby **GRANTED** and it is

ORDERED that:

1.   Defendants' Joint Motion for Summary Judgment that Plaintiff is Not Entitled to

Reasonable Royalty Damages Pursuant to Fed. R. Civ. P. 56 and for Dismissal of IVS's Claims

With Prejudice (D.I. 484-2, 484-4, 494) is GRANTED; and IVS's claims accordingly are hereby

dismissed with prejudice.

2.   All counterclaims are hereby dismissed without prejudice.

3.   All remaining deadlines in the Court's current Scheduling Order (D.I. 381) are

hereby stricken.

IT IS SO ORDERED.

Dated: April 8, 2015

Arenda L. Wright Allen
United States District Judge

_____
United States District Court Judge

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy [PROPOSED] ORDER GRANTING SUMMARY JUDGMENT AND DISMISSAL has been served on April 7, 2015 via ECF to the counsel listed below:

Michael K. Mutter, VSB# 21172 Email: mkm@bskb.com Robert J. Kenney, VSB# 27668 Email: rjk@bskb.com Quentin R. ("Rick") Corrie, VSB# 14140 Email: qrc@bskb.com BIRCH, STEWART, KOLASCH & BIRCH, LLP 8110 Gatehouse Road, Suite 100 East P.O. Box 747 Falls Church, VA 22040-0747 (703) 205-8000 (703) 205-8050 (facsimile) *ATTORNEYS FOR PLAINTIFF,* *INTELLIGENT VERIFICATION* *SYSTEMS, LLC*	William R. Poynter, VSB #48672 Email: wpoynter@kaleolegal.com John B. Swingle, VSB #82704 Email: jswingle@kaleolegal.com KALEO LEGAL 4456 Corporation Lane, Suite 135 Virginia Beach, VA 23452 Tel: (757) 238-6383 Fax: (757) 304-6175 Craig L. Mytelka, VSB #31652 Email: cmytelka@williamsmullen.com WILLIAMS MULLEN, P.C. 222 Central Park Avenue, Suite 1700 Virginia Beach, VA 23462-3035 (757) 473-5334 (757) 473-0395 (facsimile) *ATTORNEYS FOR MAJESCO* *ENTERTAINMENT CO.*

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UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
Norfolk Division

FILED

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CLERK, U.S. DISTRICT COURT
NORFOLK, VA
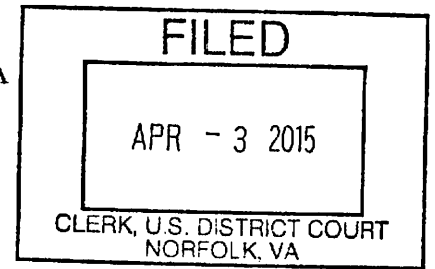
INTELLIGENT VERIFICATION
SYSTEMS, LLC,

Plaintiff,

v.   Civil Action No. 2:12cv525

MICROSOFT CORPORATION and
MAJESCO ENTERTAINMENT CO.,

Defendants.

ORDER

Before this Court are objections to the Magistrate Judge's Memorandum Opinion and Order (ECF No. 476) addressing the Motion to Partially Exclude Opinions of Julie L. Davis (ECF No. 289), the Motion in Limine to Preclude Any Reliance by Defendants on Microsoft's "Telemetry Data" or Related Alleged Summaries (ECF No. 397), the Motion in Limine to Preclude Any Reliance by Defendants on Third Party Settlement Agreements and Related Materials (ECF No. 402), the Motion in Limine (Omnibus Motion) (ECF No. 404), and the Motion in Limine Regarding Prior Art (ECF No. 409) filed by Plaintiff Intelligent Verification Systems, LLC ("Plaintiff"), and the Joint Motion to Exclude the Testimony of Walter Bratic (ECF No. 350) and the Joint Motions in Limine Numbers One through Ten (ECF No. 388) filed by Defendants Microsoft Corporation and Majesco Entertainment Company (collectively "Defendants").

As happened here, District Court Judges can empower Magistrate Judges to decide certain pretrial matters:

> [A] judge may designate a magistrate judge to hear and determine any pretrial matter pending before the court, except a motion for injunctive relief, for judgment on the pleadings, for summary judgment, to dismiss or quash an indictment or information made by the defendant, to suppress evidence in a

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criminal case, to dismiss or to permit maintenance of a class action, to dismiss for failure to state a claim upon which relief can be granted, and to involuntarily dismiss an action. A judge of the court may reconsider any pretrial matter under this subparagraph (A) where it has been shown that the magistrate judge's order is clearly erroneous or contrary to law.

28 U.S.C. § 636(b)(1)(A) (2009).

Federal Rule of Civil Procedure 72(a) gives effect to Section 636(b)(1)(A), and governs this Court's review of a Magistrate Judge's Order regarding a non-dispositive matter:

> When a pretrial matter not dispositive of a party's claim or defense is referred to a magistrate judge to hear and decide, the magistrate judge must promptly conduct the required proceedings and, when appropriate, issue a written order stating the decision. A party may serve and file objections to the order within 14 days after being served with a copy. A party may not assign as error a defect in the order not timely objected to. The district judge in the case must consider timely objections and modify or set aside any part of the order that is clearly erroneous or is contrary to law.

Fed. R. Civ. P. 72(a).

A court's "finding is 'clearly erroneous' when although there is evidence to support it, the reviewing court on the entire evidence is left with the definite and firm conviction that a mistake has been committed." *United States v. United States Gypsum Co.*, 333 U.S. 364, 395 (1948); *see also Harman v. Levin*, 772 F.2d 1150, 1152-53 (4th Cir. 1985).

"Clearly erroneous" and "contrary to law" are not synonymous. *HSBC Bank USA, Nat. Ass'n v. Resh*, No. 3:12–CV–00668, 2014 WL 317820, at *7 (S.D. W. Va. Jan. 28, 2014). For questions of law "there is no practical difference between review under Rule 72(a)'s contrary to law standard and [a] *de novo* standard." *Id.* at *7 (quoting *Robinson v. Quicken Loans Inc.*, No. 3:12–cv–0981, 2013 WL 1704839, at *3 (S.D. W. Va. Apr. 19, 2013)) (internal quotations omitted). The Court will therefore review the factual portions of the Magistrate Judge's Order under the clearly erroneous standard, but will review legal conclusions to determine if they are contrary to law. *Id.* at *7; *see Attard Indus. Inc. v. U.S. Fire Ins. Co.*, No. 1:10cv121, 2010 WL 3069799, at *1 (E.D. Va. Aug. 5, 2010).

In the Magistrate Judge's carefully researched and persuasively written Memorandum Opinion and Order, Defendants' Motion to Exclude the Testimony of Walter Bratic was granted, and Defendants' Joint Motions in Limine Numbers One through Ten were granted in part. Plaintiff's Motion to Partially Exclude the Opinions of Julie L. Davis and Plaintiff's remaining Motions in Limine were denied.

The parties petitioned the Court for an expedited briefing schedule for objections, which this Court granted. ECF No. 489. The Court received the parties' objections to the Magistrate Judge's Memorandum Opinion and Order, and has considered the objections carefully. This Court finds the Memorandum Opinion and Order to be sound and free from any error.[1] The objections (ECF No. 490) to the findings and conclusions of the Magistrate Judge's Order are **OVERRULED**.

The Clerk is **REQUESTED** to forward a copy of this Order to all parties.

IT IS SO ORDERED.

April _3rd_, 2015
Norfolk, Virginia

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Arenda L. Wright Allen
United States District Judge

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[1] This "clear error" standard of review is distinguishable from the *de novo* review standard that applies to the review of dispositive motions. *See* Fed. R. Civ. P. 72(b)(3). Because of the breadth of these motions, and the combination of factual findings and legal conclusions rendered, this Court also reviewed the Magistrate Judge's rulings *de novo.* The Magistrate Judge's comprehensive and compelling rulings pass this review easily.

UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
Norfolk Division

INTELLIGENT VERIFICATION SYSTEMS, LLC,	} } }	
Plaintiff,	} } }	
v.	} } }	Case No. 2:12-cv-525 **REDACTED VERSION**
MICROSOFT CORP., *et al.*,	} } }	
Defendants.	} } } }	

MEMORANDUM OPINION AND ORDER

This matter is before the Court on Plaintiff Intelligent Verification Systems, LLC's

("IVS") Motion to Partially Exclude Opinions of Julie L. Davis, ECF No. 289, Motion in Limine

to Preclude Any Reliance by Defendants on Microsoft's "Telemetry Data" or Related Alleged

Summaries, ECF No. 397, Motion in Limine to Preclude Any Reliance by Defendants on Third

Party Settlement Agreements and Related Materials, ECF No. 402, Motion in Limine (Omnibus

Motion), ECF No. 404, Motion in Limine Regarding Prior Art, ECF No. 409, and Defendants

Microsoft Corporation and Majesco Entertainment Company's (collectively "Defendants") Joint

Motion to Exclude the Testimony of Walter Bratic, ECF No. 350, and Defendants' Joint Motions

in Limine Numbers One through Ten, ECF No. 388. On March 20, 2015, the Court conducted a

hearing on all seven of these motions. The Court will first consider the parties' *Daubert* motions

and then address each motion in limine in turn.

I. EXPERT OPINIONS

A. Legal Standard

Federal Rule of Evidence 702 permits admission of "scientific, technical or other

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specialized knowledge" by a qualified expert if it will "help the trier of fact to understand the evidence or to determine a fact in issue," "the testimony is based on sufficient facts or data," "is the product of reliable principles and methods," and "the expert has reliably applied the principles and methods to the facts of the case." Fed. R. Evid. 702 ("Rule 702"). The seminal case of *Daubert v. Merrell Dow Pharm., Inc.* provides that expert testimony may be admitted pursuant to Rule 702 if the testimony is both relevant and reliable, considering a number of factors including whether the theory or technique "can be (and has been tested)," whether it "has been subjected to peer review and publication," whether it has been "generally accept[ed]" in the "relevant scientific community," and "the known or potential rate of error." 509 U.S. 579, 589, 593-94 (1993). Although the admissibility of expert opinion is "flexible," the district court must function as a gatekeeper, permitting only expert testimony that comports with Rule 702's guidelines as explained in *Daubert.* 509 U.S. at 594. Moreover, the Court's gatekeeping responsibility applies to all types of expert testimony. *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 147 (1999).

Here, both parties' damages experts utilized

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B. The Proposed Expert Opinions

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[2] As explained by the parties in their briefing and confirmed at the hearing, haptic feedback is the technical term for vibration in a hand-held controller. One such example of haptic feedback occurs in a driving game when the player takes the vehicle "off-road." The hand-held controller will vibrate to signify departure from the paved road.

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[3] "The amount that a licensor (such as the patentee) and a licensee (such as the infringer) would have agreed upon (at the time the infringement began) if both had been reasonably and voluntarily trying to reach an agreement; that is, the amount which a prudent licensee – who desired, as a business proposition, to obtain a license to manufacture and sell a particular article embodying the patented invention – would have been willing to pay as a royalty and yet be able to make a reasonable profit and which amount would have been acceptable by a prudent patentee who was willing to grant a license." *Georgia-Pacific Corp.*, 318 F. Supp. at 1120.

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C. Discussion

The parties' *Daubert* motions can be condensed to three categories: first, whether the Immersion/Sony verdict and license is more comparable than the Kinect-related settlement agreements; second, whether Mr. Bratic properly apportioned the royalty base; and third, whether Ms. Davis properly relied on telemetry data supplied by Defendants.

1. Comparability of the Licenses

The Court considers together IVS's claim that Ms. Davis's reliance on the settlement agreements is improper and Defendants' argument that Mr. Bratic relied on non-comparable licenses including the Immersion/Sony verdict and thirteen Microsoft licenses.

In establishing a reasonably royalty, the "licenses relied on by the patentee in proving damages [must be] sufficiently comparable to the hypothetical license at issue in suit," *Lucent Techns., Inc.*, 580 F.3d at 1325, because "alleging a loose or vague comparability between different technologies or licenses does not suffice," *LaserDynamics, Inc. v. Quanta Computer, Inc.*, 694 F.3d 51, 79 (Fed. Cir. 2012). Although "the fact that a license is not perfectly analogous generally goes to the weight of the evidence, not its admissibility," *Ericsson, Inc. v.*

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D-Link Sys., 773 F.3d 1201, 1227 (Fed. Cir. 2014), the Federal Circuit "ha[s] cautioned that district courts performing reasonable royalty calculations must exercise vigilance when considering past licenses to technologies *other* than the patent in suit and must account for differences in the technologies and economic circumstances of the contracting parties," *Virnetx, Inc. v. Cisco Sys.*, 767 F.3d 1308, 1330 (Fed. Cir. 2014) (citations omitted). Indeed, the district court must exercise its gatekeeping function to bar non-comparable licenses when the license does not meet the baseline of comparability test, which considers whether "the methodology is sound" and whether "the evidence relied upon [is] sufficiently related to the case at hand." *ActiveVideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1333 (Fed. Cir. 2012) (quoting *i4i Ltd. P'ship v. Microsoft Corp.*, 598 F.3d 831, 852 (Fed. Cir. 2010) (discussing the "minimum threshold" for expert testimony)). If a license meets this baseline of comparability, the degree of comparability between licenses including "the degree of relevance or accuracy . . . may go to the testimony's weight." *Id.* ("The degree of comparability of the . . . license agreements as well as any failure on the part of ActiveVideo's expert to control for certain variables are factual issues best addressed by cross examination and not by exclusion.").

Generally, settlement agreements proffered as comparable licenses are disfavored; however, in "limited circumstances" the Federal Circuit has sanctioned the use of a settlement agreement as a comparable license. In *ResQNet*, the Federal Circuit determined that a settlement agreement to the patents-in-suit was "the most reliable license in [the] record" when compared to other licenses which did not "even mention[] the patents in suit or show[] any other discernable link to the claimed technology." *ResQNet.com, Inc. v. Lansa, Inc.*, 594 F.3d 860, 870-72 (Fed. Cir. 2010). In *ResQNet*, the expert relied on seven licenses, "five of which had no relation to the

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claimed invention." *Id.* at 870. The remaining licenses both arose from litigation relating to the

patents-in-suit. *Id.* The Federal Circuit cited the expert and trial court's failure to explain the

link between the unrelated licenses and ultimately compared the licenses itself, finding that "[i]n

simple terms, the '075 patent deals with a method of communicating between host computers

and remote terminals–not training, marketing and customer support services. The re-bundling

licenses simply have no place in this case." *Id.* at 871. Thereafter, the Federal Circuit cited the

"limited scope of circumstances" outlined in *ResQNet* as occurring "where a lone settlement

agreement stood apart from all other licenses in the record as being uniquely relevant and

reliable." *LaserDynamics*, 694 F.3d at 77-78.

Here, IVS's attack on Ms. Davis's reliance on the settlement agreements, although

cloaked in other arguments including, *inter alia*, her alleged admission that the settlement

agreements were not relevant,[4] failure to investigate the agreements, and the potential prejudicial

effect of the settlement agreements, boils down to a claim that the license on which IVS relies —

the Immersion/Sony verdict and license—is more reliable than the settlement agreements. As

such, IVS claims that Defendants' settlement agreements do not fit within *ResQNet's* limited

circumstance of permitting settlement agreements only if they are the most reliable licenses on

the record. Applying *ResQNet* in its most narrow interpretation ultimately yields this conclusion:

settlement agreements are permissible as comparable licenses if they are the most reliable

licenses on the record. Indeed, both IVS and Defendants apparently agree with this

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[4] As the undersigned noted at the hearing, IVS's interpretation of Ms. Davis's deposition regarding this point is stretched, at best, and misleading, at worst. In response to the question, ▮▮▮ IVS interpreted this statement as Ms. Davis "admit[ting] [the settlement agreements] have no effect on her ultimate number; thus they are not relevant." *Id.* Such a characterization of this section of the deposition is inaccurate as ▮▮▮ An interpretation that she was admitting that the settlement agreements were irrelevant misconstrues Ms. Davis's statements.

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characterization of *ResQNet's* holding. *See* ECF No. 354 at 10 ("The Federal Circuit has

permitted consideration of settlement agreements when they are the best available evidence, that

is, the agreements most comparable to the case at hand."); ECF No. 370 at 11[5] ("Defendants fail

to prove the four settlement agreements are more reliable than the licenses presented by IVS.").[6]

Thus, whether Defendants' proposed Kinect-related settlement agreements may be relied upon as

comparable licenses is based on a comparison to IVS's Immersion/Sony verdict. Only if the

Kinect-related settlement agreements are more reliable licenses on the record can they be relied

upon by Ms. Davis. Subsumed in that consideration, then, is an analysis of the comparability of

the Immersion/Sony Verdict and whether it, or the settlement agreements, meet the baseline of

comparability test.

To reiterate the baseline of comparability test, the Federal Circuit has held that the

"degree of comparability" including its relevance and accuracy are factual questions for the jury,

but the baseline of comparability, or the "minimum threshold," requires that "the evidence relied

upon [be] sufficiently related to the case at hand." *ActiveVideo*, 694 F.3d at 1333 (quoting *i4i*,

598 F.3d at 852). For the following reasons, the Court finds that the Immersion/Sony verdict and

license does not qualify as "sufficiently related" evidence, and the Kinect-related settlement

agreements constitute the most reliable licenses on the record.

Preliminarily, at the hearing, the undersigned questioned both parties as to what evidence

could meet the baseline of comparability test to permit an expert to opine about a comparable

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[5] IVS also argued that the settlement agreement in *ResQNet* "was a license by the plaintiff in the case for the plaintiff's patent in suit," and "Defendants do not cite a single case that even considered the admissibility of a settlement agreement that did not involve the plaintiff in the case settling a case and licensing the patent in suit." *Id.* at 10-11. These claims, however, are all sub-arguments for the ultimate consideration of whether the agreements are the most reliable licenses.

[6] At the hearing, IVS relied extensively on *Apple, Inc. v. Samsung Elecs. Co.*, 11-cv-01846, 2013 WL 5958176 (N.D. Cal. Nov. 7, 2013). However, IVS relied on the holding of *Apple* without explaining how the nuances of that holding translate to this case. For example, "all experts in the *Apple* case determined that the litigation settlement in question was "not probative to their primary opinions." *See GPNE Corp. v. Apple, Inc.*, 12-cv-02885, 2014 WL 1494247, at *9 (N.D. Cal. Apr. 16, 2014) (citations omitted) (distinguishing *Apple* based on its facts).

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license.   IVS answered that once a technical expert opined as to the comparability of the technology, then the baseline test has been met; defendants argued that the technology must be related to the actual claimed invention.   The undersigned finds IVS's test—that a technical expert's opinion on comparability is sufficient to establish a baseline of comparability—to be logically inconsistent with the Court's role of acting as a gatekeeper to bar non-comparable licenses.   If a baseline of comparability could be established simply through a technical expert's opinion, then the Court's role in determining whether the "minimum threshold" had been met would be largely irrelevant, and would directly contravene the Federal Circuit's direction that "[w]hen relying on licenses to prove a reasonable royalty, alleging a loose or vague comparability between different technologies or licenses does not suffice." *LaserDynamics*, 694 F.3d at 79.   Under IVS's baseline rule, a "loose or vague comparability" would be sufficient, if indeed that comparison was spoken from the mouth of a technical expert.   Defendants' baseline of comparability answer more closely mirrors the language of *ActiveVideo* and *i4i's* "minimum threshold" test that "the evidence relied upon [be] sufficiently related to the case at hand." *ActiveVideo*, 694 F.3d at 1333 (quoting *i4i*, 598 F.3d at 852).

IVS argued that the technology in the Immersion/Sony verdict and license is comparable to the patented technology because both enhance game play and relate to user interaction. However, Mr. Bratic's citation to Dr. Rhyne's technical comparison of the technology was much more cursory: ███

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Moreover, Dr. Rhyne's opinions cited in the pleadings were not more explanatory.   IVS quoted Dr. Rhyne's "classifi[cation] of the Immersion patents as covering 'an input and output device;'" which according to IVS, rendered the '073 patents and the Immersion patents technically

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comparable. ECF No. 371 at 4. IVS also argued that the proper focus for comparability should be on the patent disclosures themselves, as opposed to how the technology is practiced in the accused device. IVS argued, citing Dr. Rhyne, that because "the Immersion patents disclosed a man-machine *interface* which provides tactile feedback also known as haptic feedback[,] . . . [t]here was no requirement that the technology of the Immersion patents must be implemented in a traditional video game controller." *Id.* Thus, the patents were comparable because "[t]he '073 patent is not *required* to be implemented in a traditional video game controller and there is also no limitation that the '073 patent could not cover a video game controller as part of an interactive apparatus." *Id.* at 5.

Mr. Bratic's reliance on the Immersion/Sony verdict and license as a comparable license and IVS's arguments in support of comparability are flawed for at least three reasons.[7] First, IVS's attempt to shift focus away from how the Immersion patent was practiced as haptic feedback in the accused Sony game controllers, to simply the Immersion patent disclosure, is misplaced. Although the patent disclosure does have some role to play in the comparability analysis, it is not a role that can swallow the license agreement entirely. IVS's attempt to dodge flaws in how the Immersion technology was implemented as haptic feedback by focusing on the patent disclosures is not sufficient to establish comparability. IVS's consideration of the Immersion patent disclosures are theoretical in nature; arguably, the Immersion patents, and even the '073 patent, need not be practiced entirely in the way they are in the accused products. But ignoring the patent's practice in the accused product, by hiding behind the language of the patent disclosures, ignores the role that the technological comparison plays within the license comparability analysis. The technological considerations are subsumed with in the ultimate

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[7] The Court also notes that the Immersion/Sony verdict and royalty rate was set years before the Federal Circuit began requiring apportionment of damages, a fact which Mr. Bratic readily admitted. ECF No. 355, attach. 2 at 17.

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consideration of the *license* comparability; so, the correct focus is on how the patented technology is practiced within the license. Moreover, IVS cited no case law supporting the proposition that a patent's disclosures could override the comparison between how the technology is practiced in considering license comparability.

Second, the Immersion/Sony technology is far from comparable to the patented technology. IVS's patented technology primarily functions as an input device, using facial recognition technology to acquire information about the player. Conversely, the Immersion/Sony technology primarily functioned as an output device, using haptic feedback to signal the player as to game play changes. Even more importantly, the Immersion/Sony technology was simply a modification of a handheld game controller, whereas the IVS's patented technology of facial recognition displaces the need for handheld game controllers, resulting in a fundamental change in game play. IVS's argument that both technologies relate generally to an "interface" is reminiscent of the Federal Circuit's rejection of a license simply because it was "PC-related." *Lucent*, 580 F.3d at 1328. Finally, regardless the technologies' comparison, Mr. Bratic's use of the Immersion/Sony verdict and license as a comparable license belies his proposition that the two are comparable. ▮▮▮▮▮▮▮▮▮▮▮▮

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▮▮▮ The fact that Mr. Bratic had to modify the royalty rate, based on the consideration that the Immersion/Sony technology was *less* valuable than the patented technology, is considerable evidence of the non-comparability of the Immersion/Sony technology.[8]

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[8] IVS argued that Defendants' failure to move to exclude Dr. Rhyne's opinion as to the comparability of the licenses is fatal to their attack on Mr. Bratic. The Court finds this argument unpersuasive. In considering the comparability

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Not only was Mr. Bratic's reliance on the Immersion/Sony verdict and license as a comparable license improper, Mr. Bratic also incorrectly relied on thirteen Microsoft licenses to support the form of his royalty under *Georgia-Pacific* Factor No. Two. ECF No. 322, attach. 10 at 36. Mr. Bratic admitted that none of these agreements involved comparable technology, but proffered them simply to support his finding that the hypothetical negotiation would produce a running royalty, as opposed to a lump sum payment. *Id.* The Northern District of California recently rejected a similar opinion in *TV Interactive Data Corp. v. Sony Corp.*, 929 F. Supp. 2d 1006 (N.D. Cal. Mar. 11, 2013). There, the expert cited agreements that were "not for technologies directly comparable" to prove that "Sony has agreed to pay running royalties ranging from $0.01 to $0.25 per unit." *Id.* at 1015. Because the expert admitted that the technologies were not comparable, the court excluded him from referencing them, even though he proposed to only use them to note that they supported his royalty rate. *Id.* Mr. Bratic attempts to do the same thing as the expert in *TV Interactive Data Corp.* He admits the technologies are not comparable, even though Factor No. Two is addressed to "[t]he rates paid by the licensee for the use of other patents *comparable* to the patent-in-suit." ECF No. 322, attach. 10 at 36. Though Mr. Bratic proposes to use the licenses simply to support the form of the royalty, the Federal Circuit has specifically rejected reliance on technologically non-comparable licenses under *Georgia-Pacific* Factor. No. Two. *See, e.g., Lucent*, 580 F.3d at 1326-28.

Notably, IVS never argued on brief or at the hearing that the Kinect-related settlement agreements were not technologically comparable. IVS's remaining disputes with the Kinect-related settlement agreements about the inclusion litigation avoidance costs in the agreements

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of the licenses, the Court has addressed Mr. Bratic's analysis and his reliance on Dr. Rhyne. Excluding any reference to the Immersion/Sony verdict and license will bar both experts from discussing it.

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and Ms. Davis's alleged failure to investigate the agreements will be subjects for cross-examination.[9]   Accordingly, the Kinect-related settlement agreements are the most reliable licenses on the record.   In addition, the Court's rejection of Mr. Bratic's reliance on the Immersion/Sony verdict and license renders Defendants' remaining challenge pertaining to Mr. Bratic's multiplication of the Immersion/Sony license rate by three moot.

2. Mr. Bratic's Apportionment Analysis

Besides Mr. Bratic's reliance on the Immersion/Sony verdict and license as a comparable license, the parties also dispute Mr. Bratic's apportionment.[10]   As discussed above, Mr. Bratic determined what hardware components of the accused products were necessary to practice the patent, identifying this as the SSPPU.   Then, he determined the cost of those necessary components as compared to the total cost of the accused product to determine what percentage of the total cost of the accused product was attributable to the SSPPU.   Mr. Bratic applied that percentage to the average sales price of the accused product to create an apportioned royalty base.   Mr. Bratic opined that ███ ██

"By statute, reasonable royalty damages are deemed the minimum amount of infringement damages 'adequate to compensate for the infringement.'" *LaserDynamics*, 694 F.3d at 66 (citing 35 U.S.C. § 284).   To properly calculate this compensation, "it is generally required that royalties be based not on the entire product, but instead on the smallest salable patent-practicing unit." *Id.* at 67 (citations omitted).   This is because "[w]here small elements of multi-component products are accused of infringement, calculating a royalty on the entire

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[9] In its *Daubert* motion, IVS also moved to exclude the settlement agreements "as unduly prejudicial under Federal Rule of Evidence 403 and subject to exclusion under Federal Rule of Evidence 408." ECF No. 316 at 9. Such arguments are properly reserved for a motion in limine, and will be addressed accordingly.

[10] Because Ms. Davis determined that a lump sum payment was a reasonable royalty, she had no need to apportion.

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product carries a considerable risk that the patentee will be improperly compensated for non-infringing components of that product." *Id.* The "Entire Market Value Rule" or "EMVR" is a "narrow exception" to the general rule requiring royalties be derived from the SSPPU. *Id.* The EMVR provides that "a patentee may be awarded damages as a percentage of revenues or profits attributable to the entire product," only "[i]f it can be shown that the patented feature drives the demand for an entire multi-component product." *Id.*

Both parties agree that this case does not qualify for the EMVR exception;[11] indeed, IVS has not asserted that its facial recognition technology drives demand for the Xbox 360 or the Xbox One. The parties' dispute hinges on whether Mr. Bratic properly apportioned the royalty base, specifically, whether he was required to apportion beyond identifying the SSPPU. Defendants argued that Mr. Bratic was required to apportion out the value attributable to the patented features, beyond just his identification of the SSPPU. IVS's response is four-fold: first, IVS argued that because the patent-in-suit is an apparatus claim, the entirety of the accused products are necessary to infringe and constitute the SSPPU, *see* ECF No. 371 at 17 ("The Xbox console, the Kinect, and the games are not broken down into smaller component parts that in turn are sold on the market. Thus, the accused products, taken together, form the 'smallest saleable unit' and 'smallest saleable patent practicing unit);'" second, that further apportionment for the value of the patented feature, beyond removing the non-infringing hardware components, was not required, *id.* at 20-21; third, at the hearing, IVS argued that once apportioned, the royalty rate

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[11] Defendants also argued that Mr. Bratic improperly relied on the entire sales of the accused product. Because IVS has admitted that it does not qualify for the EMVR exception, the Court finds no reason to permit Mr. Bratic to testify to the entire sales of the accused product. Indeed, to opine as to the entire sales under the guise of apportioning circumvents the EMVR entirely. The Federal Circuit has strongly cautioned against disclosure of an alleged infringer's total sales or revenue because of the potential to skew the jury's damages calculation. *See, e.g., Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1320 (Fed. Cir. 2011) ("The $19 billion cat was never put back into the bag even by Microsoft's cross-examination of Mr. Gemini and re-direct of Mr. Napper, and in spite of a final instruction that the jury may not award damages based on Microsoft's entire revenue from all the accused products in the case.") (citations omitted).

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itself accounts for the value of the patented features; and finally, that Mr. Bratic was prevented from apportioning the value of the patented feature because Defendants failed to provide adequate usage data.

Notably, IVS's argument on brief that the SSPPU is the entire accused product, *id.* at 17, is directly contrary to Mr. Bratic's opinion. Mr. Bratic opined:

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██ Mr. Bratic went on to identify the necessary hardware components needed to practice the patented feature and identified those necessary components as the SSPPU. *Id.* Moreover, at the hearing, IVS stated that of the eighteen components listed in the bill of materials for the accused products, only eight were identified by as being necessary to practice the patented feature. Accordingly, the undersigned disregards IVS's argument that the SSPPU is the entirety of the accused product as Mr. Bratic did not opine in that regard; rather, the SSPPU identified by Mr. Bratic was only those hardware components necessary to practice the patented feature.

Second, IVS argued that further apportionment for the value of the patented feature, beyond identification of the necessary hardware components, was not required. Although IVS cited large portions of the Federal Circuit's holding in *Virnetx, Inc. v. Cisco Systems, Inc.*, 767 F.3d 1308 (Fed. Cir. 2014) in its brief, IVS's attempt to distinguish *Virnetx* is not readily apparent. IVS seems to distinguish *Virnetx* on its facts, arguing that "[i]n *Virnetx*, the patents in suit had system and method claims that did not recite component hardware parts like the entertainment device, acquisition device, and processor." ECF No. 371 at 19. IVS also argued that "further

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apportionment beyond removal of the 'non-infringing components' from the accused products is not a requirement imposed by *Virnetx* or any other legal authority cited by Defendants." *Id.* at 21. However, these arguments fail to rebut the plain language of *Virnetx*:

> Where the smallest salable unit is, in fact, a multi-component product containing several non-infringing features with no relation to the patented feature . . . the patentee must do more to estimate what portion of the value of that product is attributable to the patented technology. To hold otherwise would permit the entire market value exception to swallow the rule of apportionment.

767 F.3d at 1327-28. Although Mr. Bratic did apportion out those hardware components not required to practice the patented feature, he did not properly apportion any value to the necessary hardware components. Indeed, a processor has "several non-infringing features with no relation to the patented feature," *id.* at 1327, yet Mr. Bratic attributed 100% of the processor to the apportioned royalty base. IVS could not plausibly argue that the processor[12] does not have any other function besides practicing the patented feature, but that is exactly what Mr. Bratic's apportionment signifies. His failure to identify the value of those necessary hardware components renders his opinion flawed and directly contrary to the Federal Circuit's provision in *Virnetx*. Moreover, Mr. Bratic's value determination based on comparing the costs of the necessary hardware components to practice the patented technology and the total cost of the accused product also fails to properly consider the value of the patented feature. This calculation still ties the alleged "value" to the necessary hardware components, not the value of the patented feature. Under *Virnetx*, Mr. Bratic was barred from ascribing all of the value of the patented feature to a multi-component product like a processor.

Further, IVS argued at the hearing that, once apportioned, the royalty rate itself accounts

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[12] A processor, also called a "CPU" or Central Processing Unit "is the brains of the computer where most calculations take place. In terms of computing power, the CPU is the most important element of a computer system." Vangie Beal, CPU-Central Processing Unit, www.webopedia.com/TERM/C/CPU.html (last visited Mar. 24, 2015).

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for the value of the patented feature. Although IVS cited *Virnetx* for this proposition, *Virnetx's* consideration of an expert's royalty rate was in the context of whether his reliance on comparable licenses was proper. *Id.* at 1330-1331. Indeed, the opposite conclusion appears to be correct. *Id.* at 1333 ("[A] patentee may not balance out an unreasonably high royalty base simply by asserting a low enough royalty rate.") (citing *Uniloc,* 632 F.3d at 1320). Moreover, Mr. Bratic did not use the royalty rate to account for the value of the patented feature within the accused product. Mr. Bratic increased his royalty rate based on an assumption that the patented technology was more valuable than the Immersion patents. Thus, any consideration of the value of the patented technology in the royalty rate was a comparison between the Immersion technology and IVS's '073 patent, not the value of the patented feature, facial recognition, to the accused product, Kinect and Xbox 360 or Xbox One.

Finally, IVS's argument that Mr. Bratic failed to apportion the value of the patented feature because Defendants did not provide adequate usage data is meritless. Regardless of whether Defendants provided usage data, it was IVS's burden to apportion the value of the patented feature to substantiate its damages claim. *See e.g., VirnetX,* 767 F.3d at 1329 ("VirnetX cannot simply hide behind Apple's sales model to avoid the task of apportionment."); *LaserDynamics,* 694 F.3d at 70 (holding that there is no "necessity-based exception to the entire market value rule"). Moreover, Mr. Bratic did not cite any lack of usage data in his analysis; rather, his "value" apportionment was based on the cost of the necessary hardware components as compared to the total cost of the accused product. Accordingly, the undersigned finds that Mr. Bratic improperly apportioned the royalty base by failing to apportion the value of the patented feature beyond his identification of the SSPPU.

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3. Ms. Davis's Reliance on Telemetry Data & Other Methodological Attacks

IVS claimed that Ms. Davis's reliance on telemetry data provided by Defendants was improper because "she never looked at the actual underlying data upon which these litigation-inspired spreadsheets are allegedly based and never asked to see that data." ECF No. 315 at 17. Defendants' explanation of the telemetry data renders IVS's argument on this point moot. At the hearing, Defendants explained that the telemetry data, or usage data, is ███████████████

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███████████████████ To review the "actual underlying data," as IVS asserted, Ms. Davis would have needed specialized training to sift through the vast amount of data collected by Microsoft. Such a duty need not be imposed on a damages expert. Ms. Davis properly relied on the spreadsheets, which according to Microsoft, were generated directly from the underlying data. Any fault with Ms. Davis's calculation regarding the telemetry data and inclusion of games that were not accused are properly the subject for cross-examination as those issues go to the weight of Ms. Davis's testimony, not the admissibility.

IVS also argued that Ms. Davis did not quantify how she arrived at her lump sum payment ████████████, arguing that "she has not provided any mathematical basis for her conclusion, did not perform any mathematical calculations to arrive at it, and she had no starting point." ECF No. 316 at 19. "[A]ny reasonable royalty analysis necessarily involves an element of approximation and uncertainty," *Lucent*, 580 F.3d at 1325 (citations omitted), and IVS's

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reliance on *Whitserve, LLC v. Computer Packages, Inc.* does not require otherwise. In *Whitserve*, the Federal Circuit stated that "while mathematical precision is not required, some explanation of both why and generally to what extent the particular factor impacts the royalty calculation is needed." 694 F.3d 10, 31 (Fed. Cir. 2012). Ms. Davis's opinion was well within the "explanation" contemplated by *Whitserve*; for example, in considering Factor No. Fifteen, Ms. Davis cited eight different considerations ultimately necessary to forming her opinion. Moreover, Ms. Davis's lump sum amount was well within the range of comparable licenses provided to her and the cost of the design-around. IVS's other arguments that Ms. Davis ignored evidence about deficiencies with the design-around again can be discussed on cross-examination as this addresses the weight of her opinion, not its admissibility.

IVS's final complaint with Ms. Davis is her failure to consider "hold-up value." Hold-up value "deals[s] with the special situation in which a technical standard is set for an industry that puts one patent holder 'in a position to "hold up" the industry participants from implementing the standard.'" *Astrazeneca AB v. Apotex Corp.*, 985 F. Supp. 2d 452, 500-501 (S.D.N.Y. 2013) (citations omitted). IVS's argument as to this point appears contradictory. On brief, IVS argued that "hold up value is not relevant to this case . . . [and] Ms. Davis must be precluded from offering her opinions regarding hold up value." ECF No. 316 at 23. IVS further noted that Ms. Davis had testified that ███

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███████████████████████████ At the hearing, moreover, IVS argued that Ms. Davis *should* have considered "hold up value" and claimed that Ms. Davis should be barred from testifying that it is irrelevant. As IVS has admitted that its patented technology is not a technical standard, ECF NO. 316 at 23, the Court sees no flaw in Ms. Davis's opinion that hold-up value is

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irrelevant. Moreover, any question as to a general negotiating advantage IVS would have had over Defendants due to the timing of the hypothetical negotiation centers on whether the negotiation would have been set in November or June 2010. Although Mr. Bratic opined that the hypothetical negotiation would have occurred in November 2010, the date of the first sale of the accused product, Ms. Davis opined that the negotiation would have occurred in June 2010, the date of first infringement when the Kinect was demonstrated for the public. IVS did not provide any evidence as to why the June 2010 date was incorrect. Accordingly, any argument that IVS had a negotiating advantage over Defendants due to the upcoming holiday season necessarily requires that the date of first infringement be set in November. As IVS has provided no evidence to contradict Ms. Davis's June 2010 date, IVS's argument as to its alleged negotiating advantage appears largely irrelevant.

In conclusion, for the reasons stated herein, Defendants' Motion to Exclude the Testimony of Walter Bratic, ECF No. 350, is **GRANTED** and IVS's Motion to Partially Exclude the Opinions of Julie L. Davis, ECF No. 289, is **DENIED**. The Court turns next to the parties' Motions in Limine.

II. MOTIONS IN LIMINE

The Motions in Limine include: IVS's Motion in Limine to Preclude Any Reliance by Defendants on Microsoft's "Telemetry Data" or Related Alleged Summaries, ECF No. 397, IVS's Motion in Limine to Preclude Any Reliance by Defendants on Third Party Settlement Agreements and Related Materials, ECF No. 402, IVS's Motion in Limine (Omnibus Motion), ECF No. 404, IVS's Motion in Limine Regarding Prior Art, ECF No. 409, and Defendants' Joint Motions in Limine Numbers 1 through 10, ECF No. 388.

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A. Legal Standard

Although not specifically provided for in the Federal Rules of Evidence, motions in limine "ha[ve] evolved under the federal courts' inherent authority to manage trials." *United States v. Verges*, No. 1:13cr222, 2014 WL 559573, at *2 (E.D. Va. Feb. 12, 2014) "The purpose of a motion in limine is to allow a court to rule on evidentiary issues in advance of trial in order to avoid delay, ensure an even-handed and expeditious trial, and focus the issues the jury will consider." *Id.* However, a motion in limine "should be granted only when the evidence is clearly inadmissible on all potential grounds." *Id.* at *3. For the following motions in limine that are denied as premature, including challenges to relevance or authentication, they may be raised again through objections at trial. *See, e.g., Columbia Gas Transmission, LLC v. Martin*, No. 3:11-cv-060, 2011 WL 9974802, at *1 (E.D. Va. Dec. 19, 2011).

B. Discussion

1. IVS's Motion in Limine to Preclude Any Reliance by Defendants on Microsoft's "Telemetry Data" or Related Summaries

IVS moved to exclude the telemetry data and other summaries on two grounds: first, as a sanction under Federal Rule of Civil Procedure 37(c) for Defendants' failure to timely disclose them in discovery; and second, because the spreadsheets are allegedly unauthenticated, inadmissible hearsay. IVS argued that, on four separate occasions, IVS requested the telemetry data either in a Request for Document Production ("RFP") or correspondence. However, it was not until IVS's Fifth RFP that IVS specifically referenced the request as "telemetry data." At the hearing, IVS represented to the Court that telemetry data would have been responsive to the Second RFP, September 2013 letter, and Fifth RFP.[13] Based on this case's lengthy factual history replete with motions to compel, the Court finds it perplexing indeed that if those three

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[13] Counsel conceded that the First RFP cited in IVS's brief was not targeting telemetry data.

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requests were directed at telemetry data, IVS would have declined to file a motion to compel on such arguably relevant evidence. Regardless of this consideration, however, Microsoft did timely produce spreadsheets of the telemetry data on September 18, 2014, one month after the Fifth RFP's specific request.

IVS also attacks the admissibility of the spreadsheets arguing that they were not produced in the ordinary course of business and are unauthenticated. As previously described by Microsoft's counsel at the hearing, this data was kept in the regular course of business, but the unwieldy nature of the data requires specific extraction. In their briefing and at the hearing, Microsoft extended IVS the opportunity to inspect the data in its raw form. Moreover, IVS's attack on the authentication of the data is ill-suited to a motion in limine. Defendants will proffer a foundation at trial, then if that is inadequate, IVS may object. Moving to exclude without any knowledge of the proffered foundation, however, is premature. Accordingly, IVS's Motion in Limine, ECF No. 397, is **DENIED.**

2. IVS's Motion in Limine to Preclude Any Reliance by Defendants on Third Party Settlement Agreements and Related Materials

IVS argued that the settlement agreements and related materials should be excluded pursuant to Federal Rule of Evidence 403 and 408, as inadmissible hearsay, and based on Defendants' inability to authenticate the agreements. As this Court already concluded that the settlement agreements constitute the most reliable, and therefore probative, evidence on the record, any prejudicial effect of the settlement agreements is greatly outweighed by their probative value. Moreover, Defendants' ability to lay a proper foundation is a question to be addressed after Defendants attempt to authenticate the agreements. Any question as to authentication is purely speculative at this stage in the litigation. Finally, to the extent that IVS contends the settlement agreements themselves are hearsay evidence, IVS does not contend that

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Ms. Davis's reliance on the settlement agreements is improper as experts routinely on inadmissible evidence. Rather, IVS attempts to block the settlement agreements admission as evidence. However, whether the settlement agreements constitute hearsay will depend on their proffered purpose and factual context. Indeed, it is for this reason that "[o]rders in limine which exclude broad categories of evidence should rarely be employed. A better practice is to deal with questions of admissibility of evidence as they arise." *Sperberg v. Goodyear Tire & Rubber Co.,* 519 F.2d 708, 712 (6th Cir. 1975). Accordingly, IVS's Motion in Limine, ECF No. 402, is **DENIED**.

3. IVS's Omnibus Motion in Limine

The parties represented that IVS's Motion in Limine Nos. One through Six, and Thirteen have been resolved by the parties; accordingly, with respect to these claims, the Court finds that they are **MOOT**.[14] Thus, the Court will only address the remaining disputed claims. For the following reasons, IVS's Omnibus Motion in Limine, ECF No. 404, is **DENIED.**

A. IVS's Motion in Limine No. Seven

IVS seeks to exclude any argument or evidence regarding an opinion of counsel. In response, Defendants proposed that they would consent to this request if IVS agreed not to argue that Defendants *should* have sought an opinion of counsel. IVS declined to stipulate to this agreement. At the hearing, Defendants represented that they do not intend to offer any evidence or argument regarding an opinion of counsel; thus, it is unclear as to what evidence IVS is attempting to exclude in this motion in limine. Accordingly, IVS's Motion in Limine No. Seven is DENIED.

B. IVS's Motions in Limine No. Eight

IVS's Motion in Limine No. Eight seeks to exclude the defenses of unpatentability and

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[14] Additionally, Nos. One through Six, and Thirteen are included in the parties' stipulation. ECF No. 474.

prosecution history estoppel because Defendants did not provide any facts in discovery that would support these defenses. This motion "attack[s] the propriety of allowing Defendant[s] to proceed with several affirmative defenses, based upon the evidence produced – or not produce – during discovery." *Telewizja Polska USA, Inc. v. Echostar Satellite Corp.*, No. 02 C 3293, 2004 WL 2367740, at *1 (N.D. Ill. Oct. 15, 2004). Accordingly, "[b]ecause a motion in limine is not the appropriate vehicle for addressing the strength of the evidence or the substance of a complaint," *id.*, IVS's Motion in Limine No. Eight is DENIED.

C. IVS's Motions in Limine Nos. Nine and Eleven

IVS's Motion in Limine No. Nine seeks to exclude any argument, evidence or reference to Defendants' corporate citizenship, charitable acts, and similar matters. IVS's Motion in Limine No. Eleven seeks to exclude all evidence relating to Kinect for Windows or any other non-accused products. A motion in limine should only be granted when the evidence is undoubtedly inadmissible on all potential grounds. *Verges*, 2014 WL 559573, at * (citing *United States v. Brawner*, 173 F.3d 966, 970 (6th Cir. 1999)). At this stage, not having been presented with the factual context for which these arguments and evidence may be proffered, the Court cannot sanction such a broad exclusion. Accordingly, IVS's Motions in Limine No. Nine and Eleven are DENIED.

D. IVS's Motion in Limine No. Ten

IVS seeks to preclude the Defendants from using the existence of their own patents as any form of non-infringement defense. Defendants argue that to the extent their patents are permitted by law, such as evidence relating to willful infringement, the patents should be admitted. Moreover, Defendants argue that the patents are relevant to the development process of the accused products and relevant to their damages defense. A defendant's patents are

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relevant to rebut a claim of willful infringement, *see King Instrument Corp. v. Otari Corp.*, 767 F.2d 853, 867 (Fed. Cir. 1985), and any relevance to the development process and damages defense will be determined based on the Defendants' factual context and proffered purpose of the evidence at trial. Accordingly, IVS's Motion in Limine No. Ten is DENIED.

E. IVS's Motion in Limine No. Twelve

IVS seeks to preclude testimony about the functioning of the accused source code by witnesses on Microsoft's witness list and preclude expert testimony by Defendants' lay witnesses. Any scope of witness testimony is necessarily governed by the foundation laid by the party proffering the testimony. Accordingly, this motion is premature because it necessarily depends on whether Defendants lay an appropriate foundation and demonstrate relevance. Accordingly, IVS's Motion in Limine No. Twelve is DENIED.

F. IVS's Motion in Limine No. Fourteen

IVS seeks to exclude mischaracterizations of IVS's infringement theories. The Court will define IVS's claims for trial and what arguments are appropriate and relevant to proving or disproving those claims. Accordingly, IVS's Motion in Limine No. Fourteen is DENIED as unnecessary.

G. IVS's Motion in Limine No. Fifteen

IVS seeks to exclude improper non-infringement theories and arguments based on facial recognition not being required or necessary and based on limited time periods of non-infringement. At the hearing, Defendants represented that this motion essentially seeks to exclude Defendants' theory of their defense. Indeed, whether or not facial recognition is required or necessary for skeletal tracking may, at least, be a relevant consideration depending on the factual context in which the argument is proffered. At this juncture, the Court cannot say that

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this argument is completely irrelevant not yet having considered IVS's arguments for infringement. Accordingly, IVS's Motion in Limine No. Fifteen is DENIED.

4. Defendants' Motions in Limine Nos. One through Ten

At the hearing, the parties represented that Defendants' Motions in Limine Nos. Six through Seven have been resolved. Moreover, per the filing of the Stipulation, ECF No. 474 at 2, the Court considers Defendants' Motion in Limine No. Eight and Nine resolved. Accordingly, the Court considers Nos. Six, Seven, Eight and Nine to be **MOOT**. Thus, the Court will only address the remaining disputed motions. For the following reasons, Defendants' Motion in Limine, ECF No. 388, is **GRANTED IN PART** and **DENIED IN PART**.

A. Defendants' Motion in Limine No. One

By this motion, Defendants seek to preclude IVS from making any reference and offering at trial evidence stemming from Immersion/Sony litigation. As outlined above, this Court has ruled that Mr. Bratic's reliance on this litigation was flawed under *Daubert*; accordingly, Defendants' Motion No. One is GRANTED.

B. Defendants' Motion in Limine No. Two

Here, Defendants seek to preclude IVS from referencing other non-comparable licenses, specifically in the context of opining as to the propriety of utilizing a running royalty as an appropriate damages benchmark. Mr. Bratic relied on thirteen Microsoft licenses involving non-comparable technology to support his opinion that the form of a running royalty was appropriate here. Again, the Court previously determined that Mr. Bratic's reliance on these non-comparable licenses was flawed; thus, for the reasons stated herein, Defendants' Motion No. Two is GRANTED.

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C. Defendants' Motions in Limine Nos. Three and Four,

Defendants Motion in Limine No. Three seeks to preclude IVS from referencing the sales volume of Defendants' accused products. Defendants' Motion in Limine No. Four seeks to preclude any reference to Microsoft's valuation, revenues, profitability, and cash reserves. As this Court previously determined above, IVS does not qualify for the EMVR exception, and thus is barred from relying on the total revenue or sales of Defendants' accused products. Accordingly, Defendants' Motions in Limine Nos. Three and Four are GRANTED.

D. Defendants' Motions in Limine Nos. Five and Ten

Motion in Limine No. Five seeks to preclude any reference to unrelated legal proceedings involving the Defendants. Defendants' Motion in Limine No. Ten seeks to preclude any mention of expert's prior retention by counsel in this case. "The purpose of a motion in limine is to allow a court to rule on evidentiary issues in advance of trial in order to avoid delay, ensure an even-handed and expeditious trial, and focus the issues the jury will consider." *Verges*, No. 2014 WL 559573, at *2. Such motions are disfavored, and should only be granted when the evidence is clearly inadmissible on all potential grounds. *Id.; Hawthorne Partners v. AT&T Techs., Inc.*, 831 F.Supp. 1398 (N.D. Ill. 1993). Often, whether evidence should be admissible will depend upon the factual context in which it is placed. Accordingly, "[o]rders in limine which exclude broad categories of evidence should rarely be employed. A better practice is to deal with questions of admissibility of evidence as they arise." *Sperberg*, 519 F.2d at 712.

At this juncture, the Court cannot say that all evidence regarding the Defendants' other legal proceedings is irrelevant and therefore should not be admitted. Moreover, neither can any evidence relating to an expert's prior retention by counsel be definitely excluded as irrelevant. Certainly, such information cannot be admitted without the appropriate foundation and

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demonstration of relevance. However, absent the factual context in which such evidence might be proffered, an order excluding all such evidence before trial is premature. Consequently, Defendants' Motion in Limine Nos. Five and Ten are DENIED, and the Court will rule on these issues as they arise at trial.

5. IVS's Motion in Limine Regarding Prior Art

IVS seeks to preclude any evidence relating to Nitta 1997 because it is allegedly not prior art under 35 U.S.C. §§ 102 or 103; preclude any evidence or testimony regarding work in Japan because any relevance is outweighed by a high likelihood of confusion and possible prejudice; preclude any prior art references that were not part of an expert report and require expert testimony; and preclude any prior art not timely disclosed in discovery. For the following reasons, IVS's Motion in Limine, ECF No. 409, is **DENIED**.

IVS argues that Nitta 1997, a prior art publication relied upon by Defendants, is not prior art under 35 U.S.C. §§ 102(a), (b), and 103 because only patents and printed publications from foreign countries may qualify as prior art. "Because there are many ways in which a reference may be disseminated to the interested public, 'public accessibility' has been called the touchstone in determining whether a reference constitutes a 'printed publication' bar under 35 U.S.C. § 102(b)." *SRI Int'l, Inc. v. Internet Sec. Sys., Inc.*, 511 F.3d 1186, 1194 (Fed. Cir. 2008) (quoting *In re Hall*, 781 F.2d 897, 898-99 (Fed. Cir. 1986)). "A given reference is 'publicly accessible' upon a satisfactory showing that such document has been disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art exercising reasonable diligence, can locate it." *Id.* (quoting *Bruckelmyer v. Ground Heaters, Inc.*, 445 F.3d 1374, 1378 (Fed. Cir. 2006)). According to IVS, Dr. Nitta, one of the authors of Nitta 1997, did not provide adequate evidence that Nitta 1997 had been publicly accessible such

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that it could qualify as prior art. However, Dr. Nitta testified that he presented Nitta 1997 at a workshop in Nagoya, Japan in 1997. ECF No. 413 at 6. He testified that based on his understanding, he believed that everyone registered for his workshop, about fifty participants, received a copy of his paper. *Id.* He based this conclusion on the fact that he received a paper as a printed copy of the paper was distributed to all participants at the workshop. *Id.* at 7. Based on Dr. Nitta's testimony, Defendants have established enough evidence to prove that Nitta 1997 was publicly accessible such that it qualifies as prior art.[15] Moreover, any evidence or testimony by Drs. Nitta and Hasegawa regarding Nitta 1997 and other prior art references will most likely be relevant to providing context for the prior art. Accordingly, with regard to Nitta 1997 and Drs. Hasegawa and Nitta's testimony and evidence, the motion is DENIED.

IVS also seeks to exclude prior art references which were not part of an expert report and require expert testimony. IVS does not rely on any specific law for the proposition that prior art requires expert testimony, but generally relies on the principle that certain prior art references are highly technical and scientific in nature and may require expert testimony. Without presentation of those prior art references and the proffered testimony to explain them, the Court cannot implement such a broad exclusion as requested by IVS. Accordingly, with respect to prior art references not included in the expert reports and allegedly requiring expert testimony, this motion is premature, and the Court DENIES it.

Finally, IVS seeks to exclude prior art references not disclosed in discovery. At the hearing, Defendants represented that all the prior art references cited in their 35 U.S.C. § 282 Notice were disclosed in discovery, specifically in response to IVS Interrogatory No. 6. Accordingly, this motion is DENIED with respect to prior art references allegedly not disclosed

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[15] It is curious that, although Nitta 1997 was repeatedly cited and relied upon by Microsoft in its summary judgment motion, only now does IVS raise the claim that Nitta 1997 is not prior art. *See* ECF No. 257.
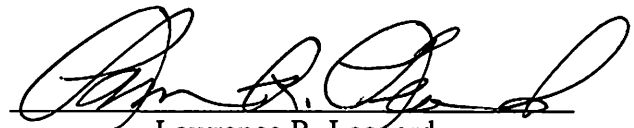
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in discovery.

III. CONCLUSION

In summary, for the reasons stated herein, Defendants' Motion to Exclude the Testimony of Walter Bratic, ECF No. 350, is **GRANTED**, and IVS's Motion to Partially Exclude the Opinions of Julie L. Davis, ECF No. 289, is **DENIED**. IVS's Motion in Limine, ECF No. 397, is **DENIED**. IVS's Motion in Limine, ECF No. 402, is **DENIED**. IVS's Omnibus Motion in Limine, ECF No. 404, is **DENIED**. Defendants' Motion in Limine, ECF No. 388, is **GRANTED IN PART** and **DENIED IN PART**. IVS's Motion in Limine, ECF No. 409, is **DENIED**.

The Clerk is **DIRECTED** to forward a copy of this Memorandum Opinion and Order to all counsel of record.

It is so **ORDERED**.

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Lawrence R. Leonard
United States Magistrate Judge

Norfolk, Virginia
March 24, 2015

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US007062073B1

(54) **ANIMATED TOY UTILIZING ARTIFICIAL INTELLIGENCE AND FACIAL IMAGE RECOGNITION**

(76) Inventors: **David M. Tumey**, 6100 Saddle View La., Crestview, FL (US) 32536; **Tianning Xu**, 400 W. Bitteros Rd. #809, San Antonio, TX (US) 78216

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/488,390**

(22) Filed: **Jan. 19, 2000**

Related U.S. Application Data

(60) Provisional application No. 60/116,391, filed on Jan. 19, 1999.

(51) **Int. Cl.**
G06K 9/00 (2006.01)
A63H 30/00 (2006.01)

(52) **U.S. Cl.** **382/118**; 446/175

(58) **Field of Classification Search** 382/116–127, 382/100, 276; 446/175; 700/31
See application file for complete search history.

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(74) *Attorney, Agent, or Firm*—Eric W. Cernyar, P.C.

(57)   **ABSTRACT**

An articulated and animated toy capable of recognizing human users and selected inanimate objects and interacting therewith which includes a computer-based device having stored thereon encoded first human or human-like facial images, a video camera and video digitizer for acquiring data representative of a second human or human-like facial image, and software resident within said computer-based device for facial recognition, which includes Principal Component Analysis, Neural Networks, or another equivalent algorithm for comparing said first human or human-like facial images with said second human or human-like facial image and producing an output signal therefrom for use in identifying said human users. The apparatus can further include software for recognizing speech, generating speech and controlling animation of the articulated toy. In addition, said computer-based device is capable of learning and storing information pertaining to each of said human users such as name, age, sex, favorite color, etc., and to interact with each of said human users on an individual basis, providing entertainment tailored specifically to each of said human users.

15 Claims, 6 Drawing Sheets
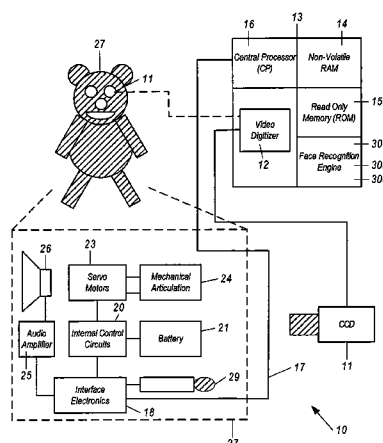
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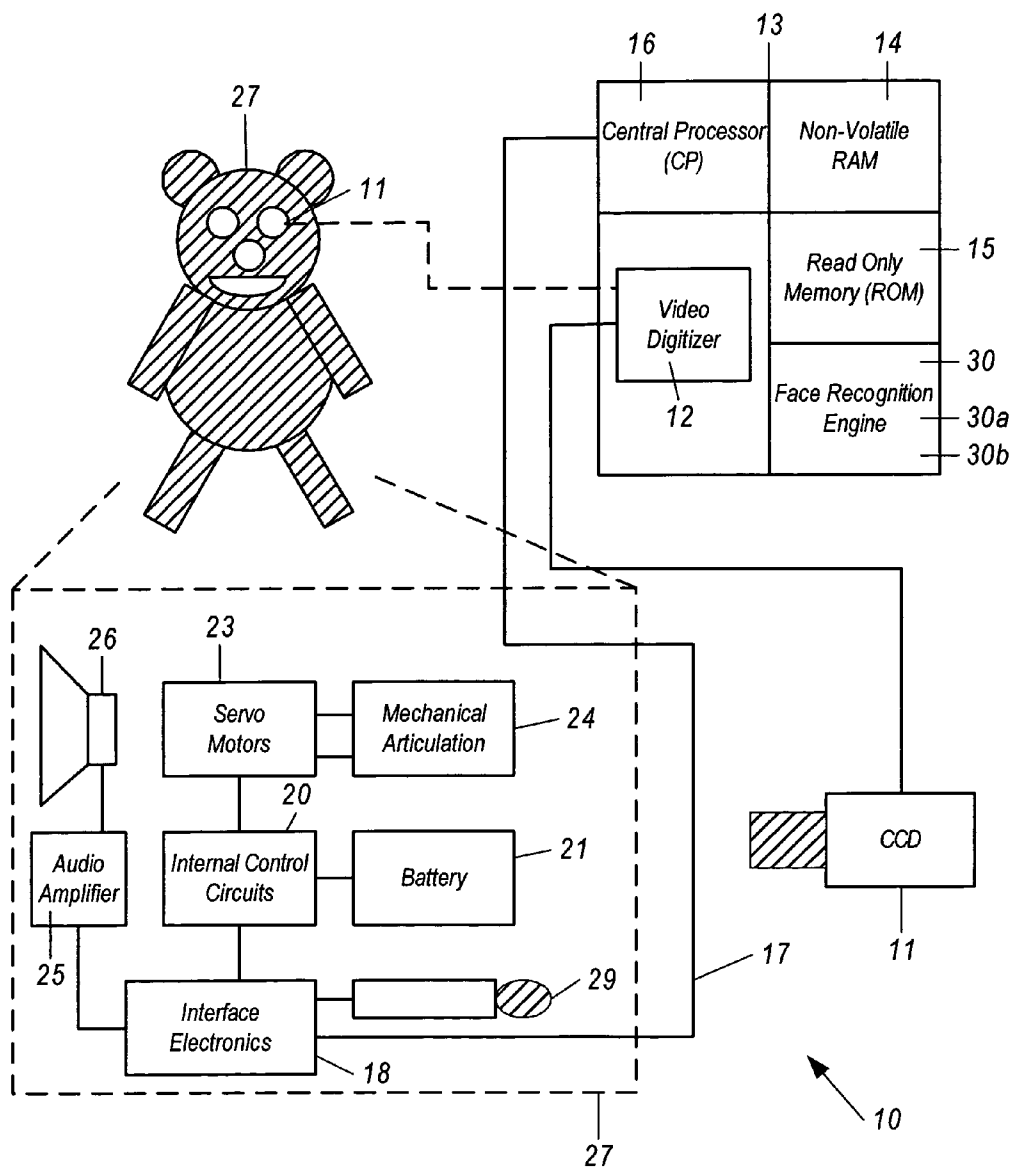
FIG. 1
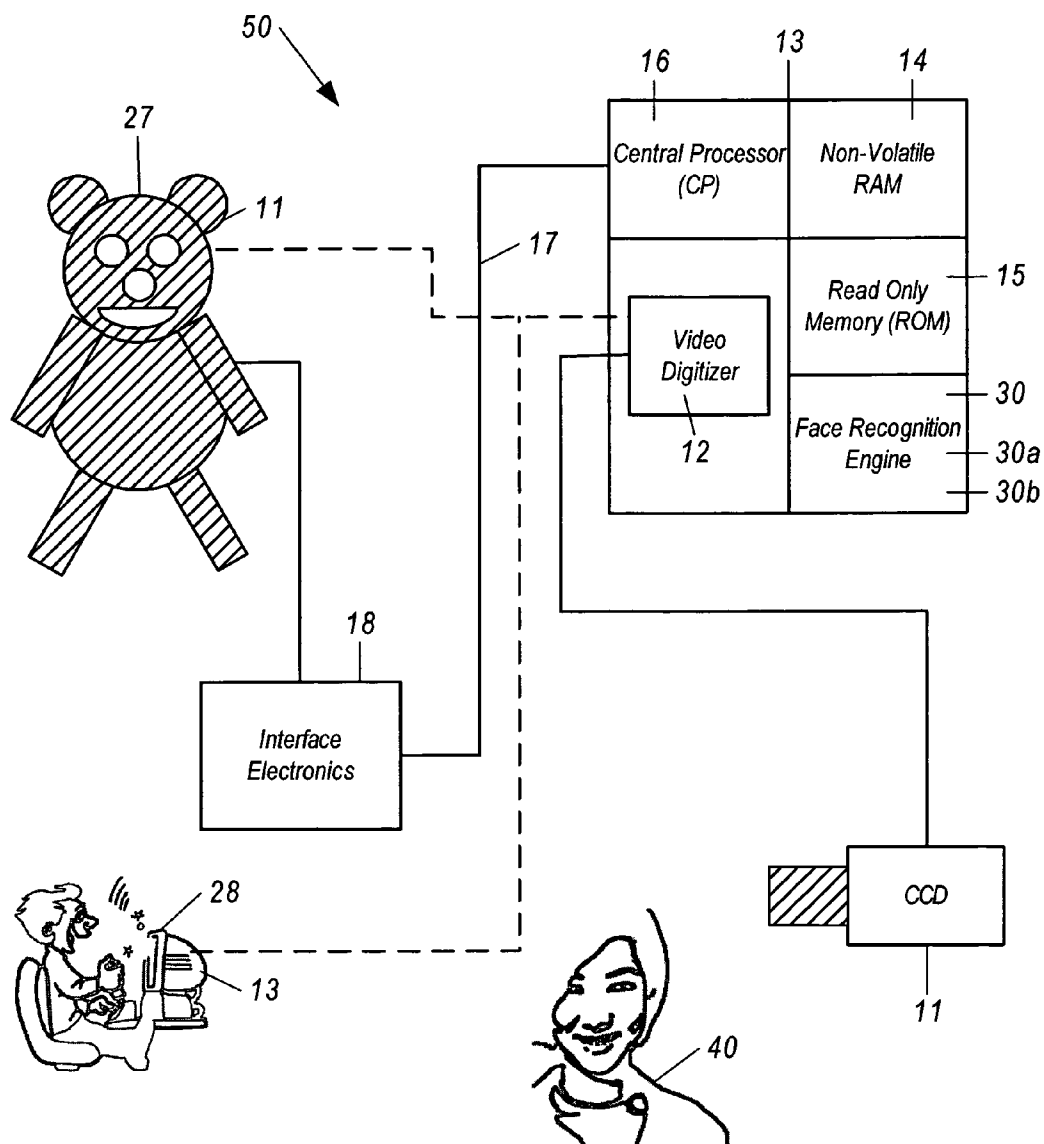
FIG. 2
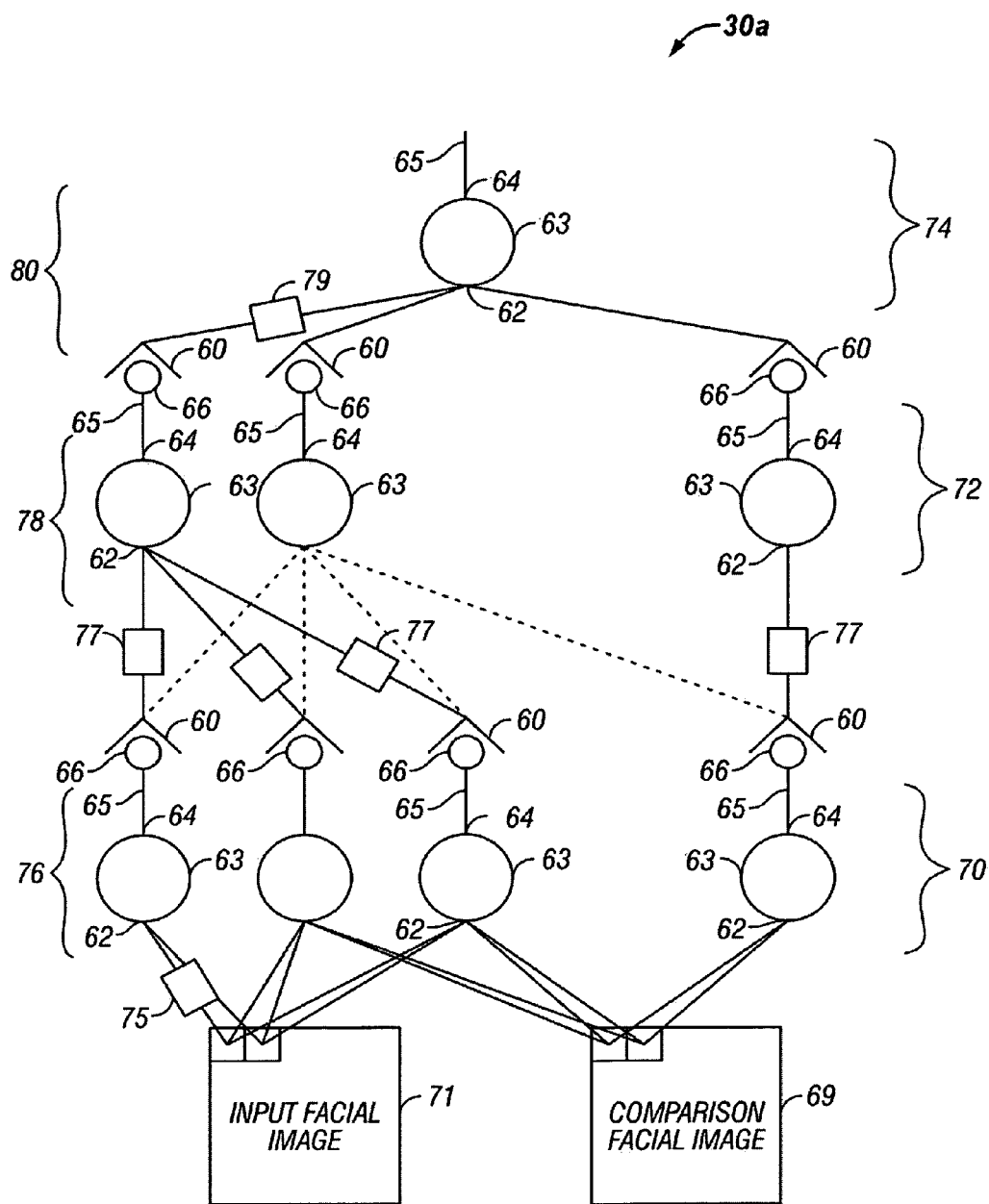
FIG. 3

FIG. 4

FIG. 5

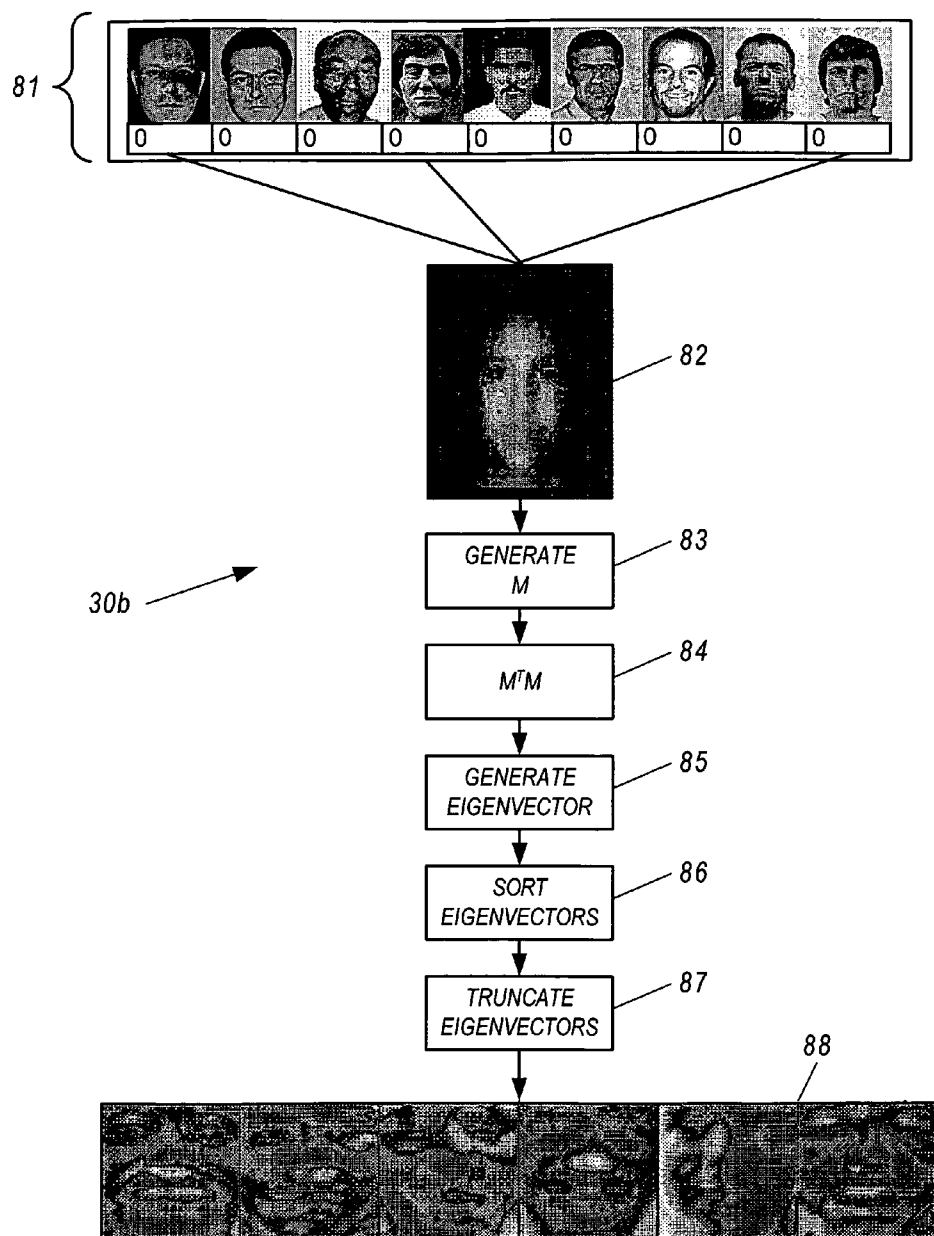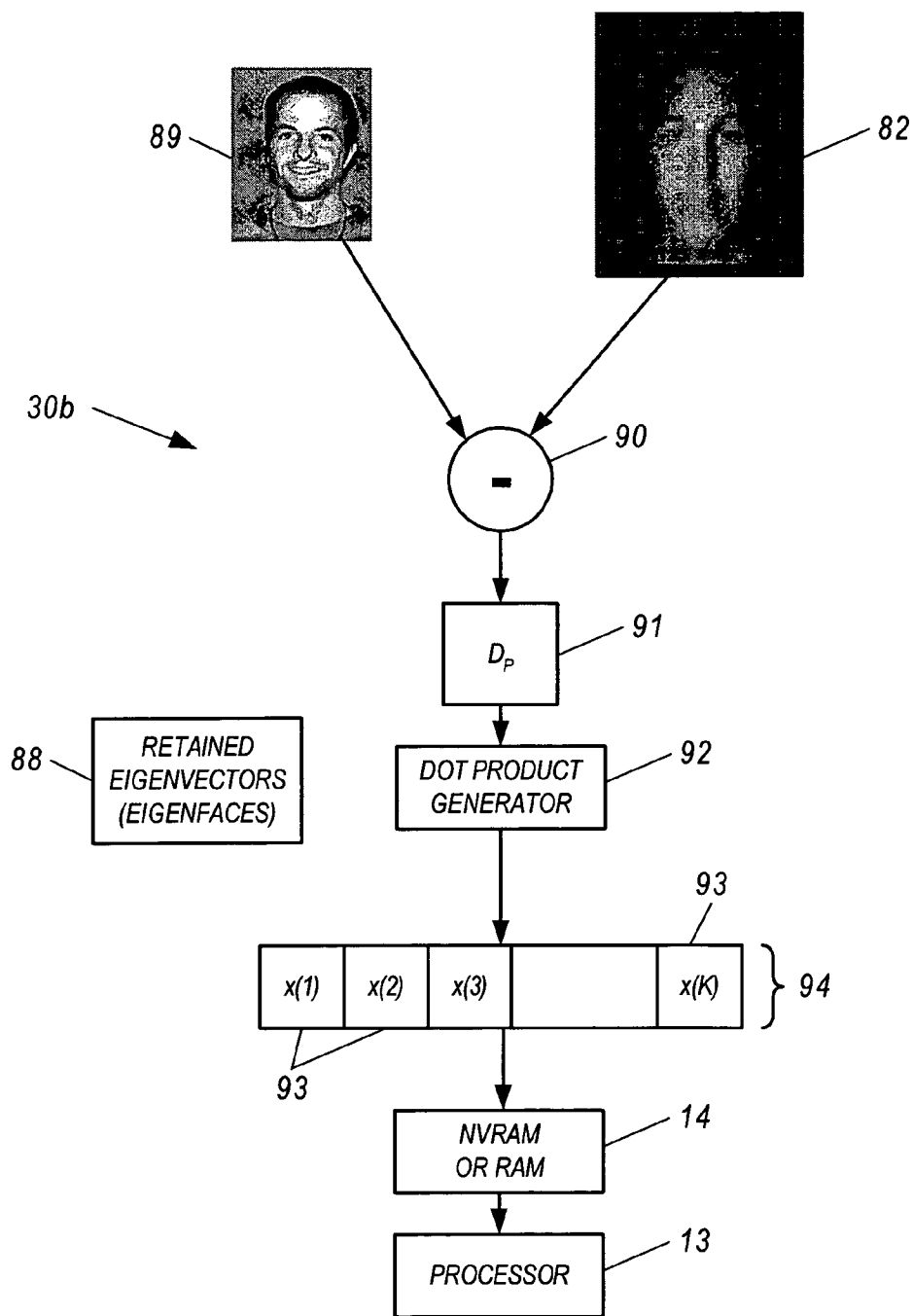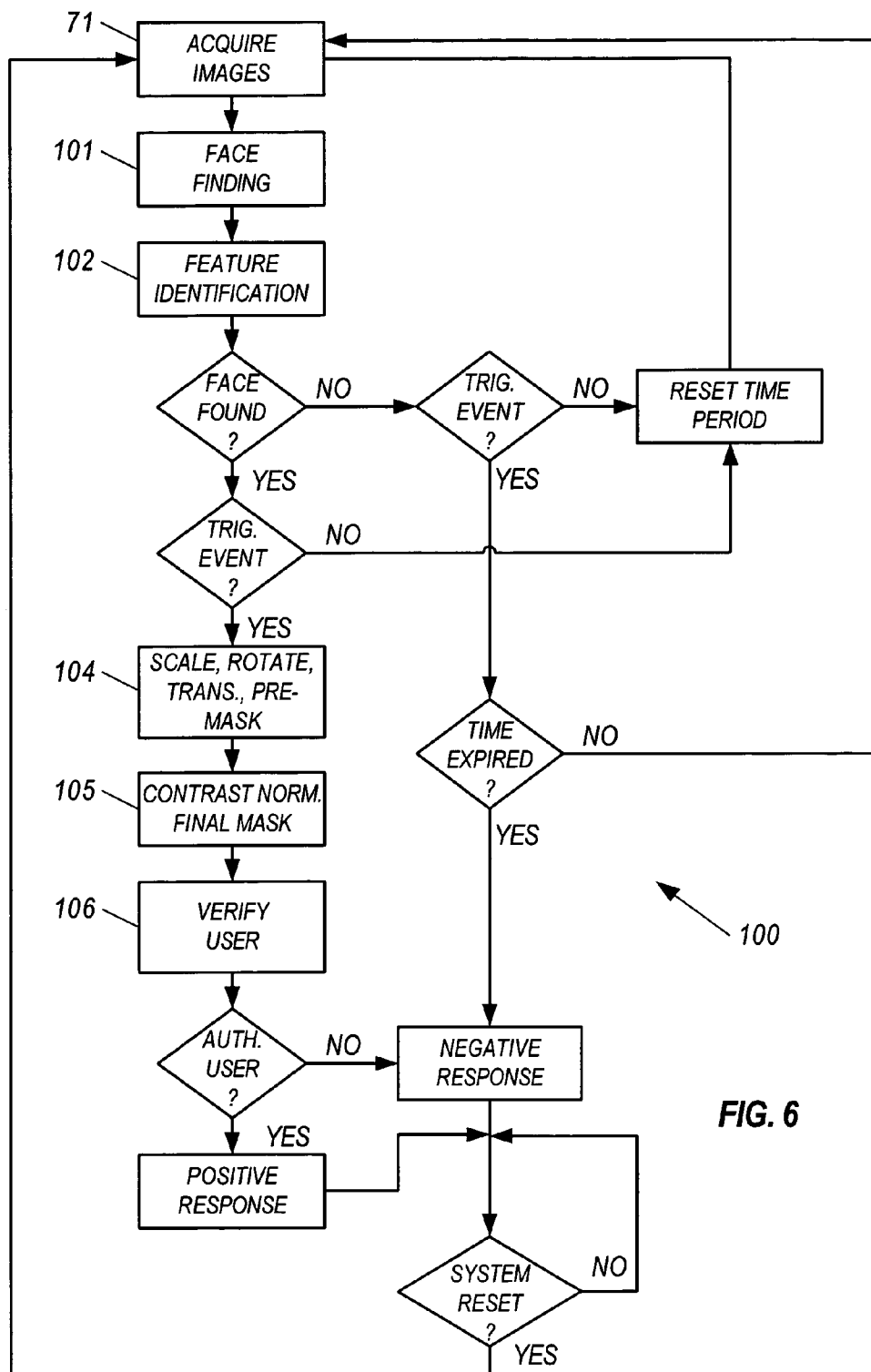*FIG. 6*

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ANIMATED TOY UTILIZING ARTIFICIAL INTELLIGENCE AND FACIAL IMAGE RECOGNITION

RELATED APPLICATIONS

This Application claims the benefit of U.S. Provisional Patent Application Ser. No. 60/116,391 filed Jan. 19, 1999.

FIELD OF THE INVENTION

The present invention relates to interactive toys and other interactive entertainment systems.

BACKGROUND AND SUMMARY OF THE INVENTION

There are a number of articulated and animated toys capable of interacting with human users in a way which appears intelligent such as those which are commercially available under the trademarks Furby® from Tiger Electronics, Ltd., and Barney® from MicroSoft Inc. These toys are capable of understanding speech, speaking in a natural language and demonstrating limited animation such as mouth, eye and ear movements. In addition, prior to the development of these more sophisticated toys, which generally include an embedded microprocessor and computer-based algorithm, other predecessors such as that which is commercially available under the trademark Teddy Ruxpin™ from YES! Entertainment Corporation, are also capable of exhibiting semi-intelligent behavior through speech and animation. Teddy Ruxpin™, and other toys like it, utilize a tape mechanism to provide the sound and animation control. Without exception, to date, a toy has never been developed which is capable of recognizing the human user who is playing with the toy. In addition, a toy has never been developed which is capable of recognizing inanimate objects with human-like faces such as dolls, stuffed animals or other toys.

There exists many methods for creating the semblance of intelligence in a toy or video game. Toys with animated moving parts are commonplace and anyone of ordinary skill in the art will be familiar with several methods to fabricate quasi-intelligent articulated toys. Similarly there exists many methods for the biometric identification of humans which includes fingerprint pattern matching, voice recognition, iris scanning, retina imaging as well as facial image recognition.

Fingerprint, iris and retina identification systems are considered "invasive", expensive and not practical for applications where limited computer memory storage is available. Voice recognition, which is not the same as speech recognition, is somewhat less invasive, however it is cost prohibitive and can require excessive memory storage space for the various voice "templates". In addition, identification processing delays can be excessive and unacceptable for many applications.

Face recognition is known and is perhaps the least invasive way to identify a human user. Another known advantage of a face recognition and identification system is that it can be constructed in such a way that its operation is transparent to the user. The prior art references are replete with biometric verification systems that have attempted to identify an individual based on a whole or partial digitized facial image. A major problem that has been recognized implicitly or explicitly by many prior reference inventors is that of securing adequate memory capacity for storing an encoded

representation of a person's face on a medium that is compact and inexpensive. Because of this and other limitations, none of the prior references provides suitable means for use in articulated and animated toys. Notable among the prior reference patents pertaining to facial image recognition:

U.S. Pat. No. 3,805,238, wherein Rothfjell teaches an identification system in which major features (e.g. the shape of a person's nose in profile) are extracted from an image and stored. The stored features are subsequently retrieved and overlaid on a current image of the person to verify identity.

U.S. Pat. No. 4,712,103, wherein Gotanda teaches, inter alia, storing a digitized facial image in a non-volatile ROM on a key, and retrieving that image for comparison with a current image of the person at the time he/she request access to a secured area. Gotanda describes the use of image compression, by as much as a factor of four, to reduce the amount of data storage capacity needed by the ROM that is located on the key.

U.S. Pat. No. 4,858,000 wherein Lu teaches an image recognition system and method for identifying ones of a predetermined set of individuals, each of whom has a digital representation of his or her face stored in a defined memory space.

U.S. Pat. No. 4,975,969, wherein Tal teaches an image recognition system and method in which ratios of facial parameters (which Tal defines a distances between definable points on facial features such as a nose, mouth, eyebrow etc.) are measured from a facial image and are used to characterize the individual. Tal, like Lu in U.S. Pat. No. 4,858,000, uses a binary image to find facial features.

U.S. Pat. No. 5,031,228, wherein Lu teaches an image recognition system and method for identifying ones of a predetermined set of individuals, each of whom has a digital representation of his or her face stored in a defined memory space. Face identification data for each of the predetermined individuals are also stored in a Universal Face Model block that includes all the individual pattern images or face signatures stored within the individual face library.

U.S. Pat. No. 5,053,603, wherein Burt teaches an image recognition system using differences in facial features to distinguish one individual from another. Burt's system uniquely identifies individuals whose facial images and selected facial feature images have been learned by the system. Burt's system also "generically recognizes" humans and thus distinguishes between unknown humans and non-human objects by using a generic body shape template.

U.S. Pat. No. 5,164,992 wherein Turk and Pentland teach the use of an Eigenface methodology for recognizing and identifying members of a television viewing audience. The Turk et al system is designed to observe a group of people and identify each of the persons in the group to enable demographics to be incorporated in television ratings determinations.

U.S. Pat. No. 5,386,103, wherein Deban et al teach the use of an Eigenface methodology for encoding a reference face and storing said reference face on a card or the like, then retrieving said reference face and reconstructing it or automatically verifying it by comparing it to a second face acquired at the point of verification. Deban et al teach the use of this system in providing security for Automatic Teller Machine (ATM) transactions, check cashing, credit card security and secure facility access.

U.S. Pat. No. 5,432,864, wherein Lu et al teach the use of an Eigenface methodology for encoding a human facial image and storing it on an "escort memory" for later

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retrieval or automatic verification. Lu et al teach a method and apparatus for employing human facial image verification for financial transactions.

Although many inventors have offered approaches to providing an encoded facial image that could be stored, retrieved and compared, automatically or manually, at some later time for recognizing said human user, none have succeeded in producing a system that would be viable for use in an articulated and animated toy or video game. Part of the reason for this lies in the severe constraints imposed on the image storage aspect of a system by commercially available microprocessors. Another reason is that the complexity of the algorithms and the hardware necessary to implement them makes such a recognition system cost prohibitive for use with a toy.

SUMMARY OF THE INVENTION

It is an object of the present invention to overcome the problems, obstacles and deficiencies of the prior art.

It is also an object of the present invention to provide an improved apparatus and method for recognizing faces of human users and other inanimate objects such as dolls, stuffed animals or other toys with human-like facial features for use with entertainment systems. It is a more particular object to provide such apparatus and method for use particularly with articulated and animated toys or video games.

It is another object of the present invention to improve the apparatus and method for creating the semblance of intelligence in an articulated and animated toy or video game.

The various aspects of the present invention address these and other objects in many respects, such as by providing an interactive entertainment apparatus that acquires representations of facial characteristics of an animate or inanimate object in its proximity and then produces a signal relative to the acquired representation. In another respect, the invention may provide such an interactive entertainment apparatus which responds to other types of biometric characteristics of a person in its proximity, such as fingerprint characteristics or some other type of biometric characteristic. The interactive entertainment apparatus is preferably embodied as a toy or a video game, although many other types of entertainment apparatus would also be suitable. An appropriate toy might well be embodied in the form of a teddy bear or some other form of doll.

The acquisition of the representation of the facial characteristics is preferably performed by an acquisition device associated with the entertainment device. One adaptation of the acquisition device includes a camera and digitizer for acquiring a light image of the facial characteristics and then translating the image into digital form. Other forms of acquisition devices might include tactile sensors, microphones, thermal sensors, fingerprint readers or any other form of biometric acquisition device.

A processor or CPU is preferably associated with the acquisition device to receive the acquired representations. The processor is preferably adapted to manipulate signals in order to evaluate the acquired representations, make determinations of recognition when appropriate, and produce any desired output relative to the acquired representation and/or the determinations of recognition (or lack thereof).

The processor may be adapted with software or the like which renders a toy capable of recognizing inanimate objects with human-like faces such as dolls, stuffed animals or other toys. Such capability increases the sophistication and intelligence of the toy to levels heretofore unseen. Such a toy may also be adapted to recognize its human user, to

learn specific information about the human user, and to interact individually with a number of different users. The invention can provide an entertainment system which tailors the entertainment such that different forms of entertainment are provided to different users. In addition, toys or video games of the invention can be capable of recognizing the facial expression of an individual human user and can tailor their responses to said human user in real-time thus maximizing the challenge and entertainment value of said toy or video game.

The invention has many aspects but is generally directed to method and apparatus for integrating a video camera and computer-based algorithm with an articulated and animated toy capable of recognizing the face of a human user or inanimate object such as a doll or stuffed animal with human-like facial features, and providing entertainment and interaction with said human user in response thereto. In addition, said computer-based toy can learn and store in resident memory, specific information about said human user or inanimate object and further access and recall said information for use in interacting with said human user, such as integrating personal information about said user into a story, after said user is identified. The present invention also relates to integrating video and computer-based algorithms capable of identifying characteristic facial expressions such as happy or sad faces, and providing information therefrom to any computer-based toy or video game whereupon the toy or video game's response is varied in accordance with the type of expression observed.

The algorithms of the present invention have been optimized to run quickly on small inexpensive single board computers and embedded microprocessors. Another unique feature of the present invention that helps to overcome the storage limitations is the automatic removal of facial images that are no longer utilized by the system for recognition of the human user.

One embodiment of the present invention is directed to an apparatus for an articulated and animated toy capable of recognizing human users and selected inanimate objects with human-like facial features and interacting therewith which includes a computer-based device having stored thereon encoded first human or human-like facial images, a video camera and video digitizer for acquiring data representative of a second human or human-like facial image, and software resident within said computer-based device for facial recognition, which includes Principal Component Analysis or Neural Networks, for comparing said first human or human-like facial images with said second human or human-like facial image and producing an output signal therefrom for use in identifying said human users. The apparatus can further include software for recognizing speech, generating speech and controlling animation of the articulated toy. In addition, said computer-based device is capable of learning and storing information pertaining to each of said human users such as name, age, sex, favorite color, etc., and to interact with each of said human users on an individual basis, providing entertainment tailored specifically to each of said human users.

Another embodiment is directed to a method and apparatus for recognizing the facial expression of a human user, and further providing signals thereupon to a computer-controlled device such as a toy or video game. The apparatus includes a computer-based device, video camera and video digitizer for acquiring facial images, and software resident within said computer-based device for facial recognition. The method includes the steps of acquiring a first set of data representative of human facial expressions and storing said

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expressions in said computer-based device, and acquiring a second set of data representative of human facial expressions and comparing said first and second set of data representative of human expressions utilizing Principal Component Analysis or Neural Networks, and producing an output signal therefrom for use in maximizing the challenge and entertainment value of said toy or video game.

Many other objects, features and advantages will be readily apparent to those of ordinary skill in the art upon viewing the drawings and reading the detailed description hereafter.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** shows a block diagram of one aspect of the present invention.

FIG. **2** shows a block diagram of another aspect of the present invention.

FIG. **3** shows a representation of a neural network of the present invention.

FIG. **4** shows a representation of a Principal Component Analysis (PCA) of the present invention.

FIG. **5** shows a representation of a human or human-like facial image transformation of the present invention.

FIG. **6** shows exemplar steps utilized by the face recognition software engine in preprocessing facial image data prior to recognition/identification.

DETAILED DESCRIPTION OF THE
PREFERRED EMBODIMENT

Referring to the drawings, an apparatus for an articulated and animated toy capable of recognizing human users **40** and selected inanimate objects and interacting therewith of the present invention is generally referred to by the numeral **10**. Referring to FIG. **1**, the apparatus **10** includes a computer **13** having a central processor (CP) **16** such as those which are commercially available under the trademarks Intel® 486 or Pentium®, conventional non-volatile Random Access Memory (RAM) **14** and conventional Read Only Memory (ROM) **15**. Computer **13** can be of a standard PC configuration such as those which are commercially available under the trademarks Compaq® or Dell®, or can be miniaturized and embedded directly in the toy **27** itself. Computer **13** is further operably associated with a video digitizer **12** and video camera **11**. The video camera **11**, mounted inside the toy **27**, such as a teddy bear, doll or robot, can be a standard inexpensive Charge Coupled Device (CCD) camera, and the video digitizer **12** can be one of many off-the-shelf units commonly employed in personal computers for the acquisition of live video images such as those which are commercially available under the trademarks SNAPPY™, Philips Easy-Video™, WINNOV VideumCam™ or the Matrox Meteor™. The computer **13** has operably associated therewith a face recognition engine **30** which can be one of a Neural Network **30***a* or Principal Component Analysis (PCA) **30***b* or equivalent software engine, the particulars of which are further described hereinafter.

A communications cable **17** is likewise associated with the computer **13** and operably connected to interface electronics **18** for providing speech and articulation control signals to interface electronics **18**. If computer **13** is configured as a standard PC, the communications cable **17** will be external, while if computer **13** is embedded directly in the toy, the communications cable **17** will be internal.

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Interface electronics **18** is operably connected to the toy's **27** internal control circuits **20**. The control circuit **20** is of a standard type such as that employed by Tiger Electronic's Furby® and controls the basic functions of the toy's **27** articulation, including the animation thereof. Control circuit **20** is operably connected to a battery **21** and electronic servo motors **23**. Servo motors **23** are flexibly coupled to mechanical articulating means **24**. Servo motors **23** are arranged in such a way as to cause animation of various features of the toy **27** such as mouth, eye and ear movements.

In addition to the control functions, audio amplifier **25** speaker **26**, and microphone **29** are also operatively connected to interface electronics **18** which allow the toy **27** to recognize speech, and speak to the human user as part of its interaction protocol.

Referring now to FIG. **2**, an apparatus for recognizing the facial expression of a human user **40**, and further providing signals thereupon to a computer-based device such as a toy **27**, as described in detail above, or video game **28**, is generally referred to by the numeral **50**, includes a computer **13** having a central processor (CP) **16** such as those which are commercially available under the trademarks Intel® 486 or Pentium®, conventional non-volatile Random Access Memory (RAM) **14** and conventional Read Only Memory (ROM) **15**. Computer **13** can be of a standard PC configuration such as those which are commercially available under the trademarks Compaq® or Dell®, or can be miniaturized and embedded directly in the toy **27** or video game **28** itself. Computer **13** is operably associated with a video digitizer **12** and video camera **11**. The video camera **11**, mounted inside the toy **27** or video game **28**, can be a standard inexpensive Charge Coupled Device (CCD) camera, and the video digitizer **12** can be one of many off-the-shelf units commonly employed in personal computers for the acquisition of live video images such as those which are commercially available under the trademarks SNAPPY™, Philips Easy-Video™, WINNOV VideumCaM™ or the Matrox Meteor™. The computer **13** has operably associated therewith a face recognition engine **30** which can be one of a Neural Network **30***a* or Principal Component Analysis (PCA) **30***b* or equivalent software engine, the particulars of which are further described hereinafter.

A communications cable **17** is likewise operably associated with the computer **13** and operably connected to interface electronics **18** for providing a recognition output signal to interface electronics **18**.

Interface electronics **18** is operably connected to the toy **27** or video game **28** and actuated thereupon by a facial image/expression recognition signal from the computer **13**. The toy **27** or video game **28** can thus modulate its response to the recognized facial image/expression and maximize the challenge and entertainment value of the toy **27** or video game **28**.

Both the articulated and animated toy apparatus **10**, and the toy or video game apparatus **50** can make use of a neural network **30***a* or PCA **30***b* facial image recognition engine to generate an output signal indicative of recognition or non-recognition of a human user **40**.

There are a variety of methods by which the recognition and identification element of the present invention can be implemented. Although the methods differ in computational structure, it is widely accepted by those of ordinary skill in the art that they are functionally equivalent. An example of two practical techniques, neural network **30***a* and PCA **30***b*, are provided herein below and are depicted in FIG. **3** and FIG. **4** respectively.

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As shown in FIG. **3**, the neural network **30a** includes at least one layer of trained neuron-like units, and preferably at least three layers. The neural network **30a** includes input layer **70**, hidden layer **72**, and output layer **74**. Each of the input layer **70**, hidden layer **72**, and output layer **74** include a plurality of trained neuron-like units **76**, **78** and **80**, respectively.

Neuron-like units **76** can be in the form of software or hardware. The neuron-like units **76** of the input layer **70** include a receiving channel for receiving human or human-like facial image data **71**, and comparison facial image data **69** wherein the receiving channel includes a predetermined modulator **75** for modulating the signal.

The neuron-like units **78** of the hidden layer **72** are individually receptively connected to each of the units **76** of the input layer **70**. Each connection includes a predetermined modulator **77** for modulating each connection between the input layer **70** and the hidden layer **72**.

The neuron-like units **80** of the output layer **74** are individually receptively connected to each of the units **78** of the hidden layer **72**. Each connection includes a predetermined modulator **79** for modulating each connection between the hidden layer **72** and the output layer **74**. Each unit **80** of said output layer **74** includes an outgoing channel for transmitting the output signal.

Each neuron-like unit **76**, **78**, **80** includes a dendrite-like unit **60**, and preferably several, for receiving incoming signals. Each dendrite-like unit **60** includes a particular modulator **75**, **77**, **79** which modulates the amount of weight which is to be given to the particular characteristic sensed as described below. In the dendrite-like unit **60**, the modulator **75**, **77**, **79** modulates the incoming signal and subsequently transmits a modified signal **62**. For software, the dendrite-like unit **60** comprises an input variable X_a and a weight value W_a wherein the connection strength is modified by multiplying the variables together. For hardware, the dendrite-like unit **60** can be a wire, optical or electrical transducer having a chemically, optically or electrically modified resistor therein.

Each neuron-like unit **76**, **78**, **80** includes a soma-like unit **63** which has a threshold barrier defined therein for the particular characteristic sensed. When the soma-like unit **63** receives the modified signal **62**, this signal must overcome the threshold barrier whereupon a resulting signal is formed. The soma-like unit **63** combines all resulting signals **62** and equates the combination to an output signal **64** indicative of one of a recognition or non-recognition of a human or human-like facial image or human facial expression.

For software, the soma-like unit **63** is represented by the sum $\alpha = \Sigma_a X_a W_a - \beta$, where β is the threshold barrier. This sum is employed in a Nonlinear Transfer Function (NTF) as defined below. For hardware, the soma-like unit **63** includes a wire having a resistor; the wires terminating in a common point which feeds into an operational amplifier having a nonlinear component which can be a semiconductor, diode, or transistor.

The neuron-like unit **76**, **78**, **80** includes an axon-like unit **65** through which the output signal travels, and also includes at least one bouton-like unit **66**, and preferably several, which receive the output signal from the axon-like unit **65**. Bouton/dendrite linkages connect the input layer **70** to the hidden layer **72** and the hidden layer **72** to the output layer **74**. For software, the axon-like unit **65** is a variable which is set equal to the value obtained through the NTF and the bouton-like unit **66** is a function which assigns such value to a dendrite-like unit **60** of the adjacent layer. For hardware,

the axon-like unit **65** and bouton-like unit **66** can be a wire, an optical or electrical transmitter.

The modulators **75**, **77**, **79** which interconnect each of the layers of neurons **70**, **72**, **74** to their respective inputs determines the classification paradigm to be employed by the neural network **30a**. Human or human-like facial image data **71**, and comparison facial image data **69** are provided as inputs to the neural network and the neural network then compares and generates an output signal in response thereto which is one of recognition or non-recognition of the human or human-like facial image or human facial expression.

It is not exactly understood what weight is to be given to characteristics which are modified by the modulators of the neural network, as these modulators are derived through a training process defined below.

The training process is the initial process which the neural network must undergo in order to obtain and assign appropriate weight values for each modulator. Initially, the modulators **75**, **77**, **79** and the threshold barrier are assigned small random non-zero values. The modulators can each be assigned the same value but the neural network's learning rate is best maximized if random values are chosen. Human or human-like facial image data **71** and comparison facial image data **69** are fed in parallel into the dendrite-like units of the input layer (one dendrite connecting to each pixel in facial image data **71** and **69**) and the output observed.

The Nonlinear Transfer Function (NTF) employs α in the following equation to arrive at the output:

$$NTF = 1/[1 + e^{-\alpha}]$$

For example, in order to determine the amount weight to be given to each modulator for any given human or human-like facial image, the NTF is employed as follows:

If the NTF approaches 1, the soma-like unit produces an output signal indicating recognition. If the NTF approaches 0, the soma-like unit produces an output signal indicating non-recognition.

If the output signal clearly conflicts with the known empirical output signal, an error occurs. The weight values of each modulator are adjusted using the following formulas so that the input data produces the desired empirical output signal.

For the output layer:

$$W^*_{kol} = W_{kol} + GE_k Z_{kos}$$

W^*_{kol}=new weight value for neuron-like unit k of the outer layer.

W_{kol}=current weight value for neuron-like unit k of the outer layer.

G=gain factor

Z_{kos}=actual output signal of neuron-like unit k of output layer.

D_{kos}=desired output signal of neuron-like unit k of output layer.

$E_k = Z_{kos}(1 - Z_{kos})(D_{kos} - Z_{kos})$, (this is an error term corresponding to neuron-like unit k of outer layer).

For the hidden layer:

$$W^*_{jhl} = W_{jhl} + GE_j Y_{jos}$$

W^*_{jhl}=new weight value for neuron-like unit j of the hidden layer.

W_{jhl}=current weight value for neuron-like unit j of the hidden layer.

G=gain factor

Y_{jos}=actual output signal of neuron-like unit j of hidden layer.

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$E_j = Y_{jos}(1 - Y_{jos}) \Sigma_k (E_k {}^* W_{kol})$, (this is an error term corresponding to neuron-like unit j of hidden layer over all k units).

For the input layer:

$$W^*{}_{iil} = W_{iil} + GE_i X_{ios}$$

$W^*{}_{iil}$=new weight value for neuron-like unit I of input layer.

W_{iil}=current weight value for neuron-like unit I of input layer.

G=gain factor

X_{ios}=actual output signal of neuron-like unit I of input layer.

$E_i = X_{ios}(1 - X_{ios}) \Sigma_j (E_j {}^* W_{jhl})$, (this is an error term corresponding to neuron-like unit i of input layer over all j units).

The training process consists of entering new (or the same) exemplar data into neural network **30**a and observing the output signal with respect to known empirical output signal. If the output is in error with what the known empirical output signal should be, the weights are adjusted in the manner described above. This iterative process is repeated until the output signals are substantially in accordance with the desired (empirical) output signal, then the weight of the modulators are fixed.

Upon fixing the weights of the modulators, predetermined face-space memory indicative of recognition and non-recognition are established. The neural network is then trained and can make generalizations about human or human-like facial image input data by projecting said input data into face-space memory which most closely corresponds to that data.

The description provided for neural network **30**a as utilized in the present invention is but one technique by which a neural network algorithm can be employed. It will be readily apparent to those who are of ordinary skill in the art that numerous neural network model types including multiple (sub-optimized) networks as well as numerous training techniques can be employed to obtain equivalent results to the method as described herein above.

Referring now particularly to FIG. **4**, and according to a second preferred embodiment of the present invention, a principal component analysis (PCA) may be implemented as the system's face recognition engine **30**. The PCA facial image recognition/verification engine generally referred to by the numeral **30**b, includes a set of training images **81** which consists of a plurality of digitized human or human-like facial image data **71** representative of a cross section of the population of human faces. In order to utilize PCA in facial image recognition/verification a Karhunen-Loeve Transform (KLT), readily known to those of ordinary skill in the art, can be employed to transform the set of training images **81** into an orthogonal set of basis vectors or eigenvectors. In the present invention, a subset of these eigenvectors, called eigenfaces, comprise an orthogonal coordinate system, detailed further herein, and referred to as face-space.

The implementation of the KLT is as follows: An average facial image **82**, representative of an average combination of each of the training images **81** is first generated. Next, each of the training images **81** are subtracted from the average face **82** and arranged in a two dimensional matrix **83** wherein one dimension is representative of each pixel in the training images, and the other dimension is representative of each of the individual training images. Next, the transposition of matrix **83** is multiplied by matrix **83** generating a new matrix **84**. Eigenvalues and eigenvectors **85** are thenceforth calculated from the new matrix **84** using any number of

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standard mathematical techniques that will be well known by those of ordinary skill in the art. Next, the eigenvalues and eigenvectors **85** are sorted **86** from largest to smallest whereupon the set is truncated to only the first several eigenvectors **87** (e.g. between 5 and 20 for acceptable performance). Lastly, the truncated eigenvalues and eigenvectors **87** are provided as outputs **88**. The eigenvalues and eigenvectors **88** and average face **82** can then be stored inside the ROM memory **14** in the computer **13** for use in recognizing or verifying facial images.

Referring now to FIG. **5**, for the PCA algorithm **30**b facial image recognition/identification is accomplished by first finding and converting a human or human-like facial image to a small series of coefficients which represent coordinates in a face-space that are defined by the orthogonal eigenvectors **88**. First a preprocessing step, defined further herein below, is employed to locate, align and condition the digital video images. Facial images are then projected as a point in face-space. Verification of a human user **40** is provided by measuring the euclidean distance between two such points in face-space. Thus, if the coefficients generated as further described below represent points in face-space that are within a predetermined acceptance distance, a signal indicative of recognition is generated. If, on the other hand, the two points are far apart, a signal indicative on non-recognition is generated. Although this method is given as a specific example of how the PCA **30**b algorithm works, the mathematical description and function of the algorithm is equivalent to that of the neural network **30**a algorithm. The projection of the faces into face-space is accomplished by the individual neurons and hence the above description accurately relates an analogous way of describing the operation of neural network **30**a.

Again using the PCA **30**b algorithm as an example, a set of coefficients for any given human or human-like facial image is produced by taking the digitized human or human-like facial image **89** of a human user **40** and subtracting 90 the average face **82**. Next, the dot product **91** between the difference image and one eigenvector **88** is computed by dot product generator **92**. The result of the dot product with a single eigenface is a numerical value **93** representative of a single coefficient for the image **89**. This process is repeated for each of the set of eigenvectors **88** producing a corresponding set of coefficients **94** which can then be stored in the non-volatile RAM memory **14** operably associated with computer **13** described herein above.

As further described below, said first human or human-like facial images of a human user **40** are stored in non-volatile RAM memory **14** during the training process. Each time the facial image of human user **40** is acquired by the video camera **11** thereafter, a said second human or human-like facial image of said human user **40** is acquired, the facial image is located, aligned, processed and compared to said first human or human-like facial image by PCA **30**b or neural network **30**a. Thus, the technique as described above provides the means by which two said facial image sets can be accurately compared and a recognition signal can be generated therefrom. For facial expression recognition, individual facial images of human user **40** representative of each of said facial expressions is acquired and stored for later comparison.

The preferred method of acquiring and storing the aforesaid facial images/expressions of said human user **40**, begins with the human user **40**, providing multiple facial images of him/herself to be utilized as templates for all subsequent recognition and identification. To accomplish this, the human user **40** instructs computer **13** to enter a "learning"

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mode whereupon computer **13** gathers specific information about the human user **40** such as name, age, favorite color, etc. and prepares to gather facial images/expressions of human user **40**. The computer **13** acquires several digitized first human or human-like facial images of the human user **40** through the use of CCD video camera **11** and digitizer **12**. These first human or human-like facial images are preprocessed, the highest quality images selected and thenceforth encoded and stored in the non-volatile RAM memory **14** of computer **13**. These remaining fist human or human-like facial images will be utilized thereafter as the reference faces. When a human user **40** interacts with the toy **27** or video game **28**, the human user **40** trigger's motion detection and face finding algorithms embedded in the facial image recognition software engine **30**. At this time, video camera **11** begins acquiring second human or human-like facial images of the human user **40** and converts said second human or human-like facial images to digital data via digitizer **12**. The digitized second human or human-like facial images obtained thereafter are stored in the non-volatile memory **14** of computer **13** as comparison faces.

Once the said second human or human-like facial image has been stored in the computer **13**, the facial recognition engine **30**, either neural network **30**a or PCA **30**b can be employed to perform a comparison between said stored first human or human-like facial image and said stored second human or human-like facial image and produce an output signal in response thereto indicative of recognition or non-recognition of the human user **40**. The output signal is therewith provided to the interface electronics **18** via communications cable **17**. Interface electronics **18** is responsible for interfacing the computer **13** with the toy **27** or video game's **28** onboard control circuit **20** to enable the transfer of signals thereto.

In the event the said second human or human-like facial image or facial expression of human user **40** is recognized, the operational software resident in computer **13** can provide entertaining interaction, including speech and multiple feature animation, with human user **40**, and can tailor its responses specifically to human user **40** based on knowledge obtained during the learning and training process. Learning can continue as the user interacts with the toy **27** or video game **28** and is not limited to the information initially collected. In the event the said second human or human-like facial image of human user **40** is not recognized, the operational software resident in computer **13** can interact with the human user **40** in a generic way and can alternatively automatically enter a "learning" mode if the human user expresses a desire to interact with the toy **27** or video game **28** in this fashion.

As previously stated and referring now to FIG. **6**, a preprocessing function **100** must typically be implemented in order to achieve efficient and accurate processing by the chosen face recognition engine **30** of acquired human or human-like facial image data **71**. Whether utilizing a neural network **30**a, PCA **30**b or another equivalent face recognition engine, the preprocessing function generally comprises elements adapted for (1) face finding **101**, (2) feature extraction **102**, (3) determination of the existence within the acquired data of a human or human-like facial image **103**, (4) scaling, rotation, translation and pre-masking of the captured human image data **104**, and (5) contrast normalization and final masking **105**. Although each of these preprocessing function elements **101**, **102**, **103**, **104**, **105** is described in detail further herein, those of ordinary skill in the art will recognize that some or all of these elements may be dispensed with depending upon the complexity of the

chosen implementation of the face recognition engine **30** and desired overall system attributes.

In the initial preprocessing step of face finding **101**, objects exhibiting the general character of a human or human-like facial image are located within the acquired image data **71** where after the general location of any such existing object is tracked. Although those of ordinary skill in the art will recognize equivalent alternatives, three exemplary face finding techniques are (1) baseline subtraction and trajectory tracking, (2) facial template subtraction, or the lowest error method, and (3) facial template cross-correlation.

In baseline subtraction and trajectory tracking, a first, or baseline, acquired image is generally subtracted, pixel value-by-pixel value, from a second, later acquired image. As will be apparent to those of ordinary skill in the art, the resulting difference image will be a zero-value image if there exists no change in the second acquired image with respect to the first acquired image. However, if the second acquired image has changed with respect to the first acquired image, the resulting difference image will contain nonzero values for each pixel location in which change has occurred. Assuming that a human user **40** will generally be non-stationary with respect to the system's camera **11**, and will generally exhibit greater movement than any background object, the baseline subtraction technique then tracks the trajectory of the location of a subset of the pixels of the acquired image representative of the greatest changes. During initial preprocessing **101**, **102**, this trajectory is deemed to be the location of a likely human or human-like facial image.

In facial template subtraction, or the lowest error method, a ubiquitous facial image, i.e. having only nondescript facial features, is used to locate a likely human or human-like facial image within the acquired image data. Although other techniques are available, such a ubiquitous facial image may be generated as a very average facial image by summing a large number of facial images. According to the preferred method, the ubiquitous image is subtracted from every predetermined region of the acquired image, generating a series of difference images. As will be apparent to those of ordinary skill in the art, the lowest error in difference will generally occur when the ubiquitous image is subtracted from a region of acquired image data containing a similarly featured human or human-like facial image. The location of the region exhibiting the lowest error, deemed during initial preprocessing **101**, **102** to be the location of a likely human or human-like facial image, may then be tracked.

In facial template cross-correlation, a ubiquitous image is cross-correlated with the acquired image to find the location of a likely human or human-like facial image in the acquired image. As is well known to those of ordinary skill in the art, the cross-correlation function is generally easier to conduct by transforming the images to the frequency domain, multiplying the transformed images, and then taking the inverse transform of the product. A two-dimensional Fast Fourier Transform (2D-FFT), implemented according to any of myriad well known digital signal processing techniques, is therefore utilized in the preferred embodiment to first transform both the ubiquitous image and acquired image to the frequency domain. The transformed images are then multiplied together. Finally, the resulting product image is transformed, with an inverse FFT, back to the time domain as the cross-correlation of the ubiquitous image and acquired image. As is known to those of ordinary skill in the art, an impulsive area, or spike, will appear in the cross-correlation in the area of greatest correspondence between the ubiqui-

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tous image and acquired image. This spike, deemed to be the location of a likely human or human-like facial image, is then tracked during initial preprocessing **101, 102**.

Once the location of a likely human or human-like facial image is known, feature identification **102** is employed to determine the general characteristics of the thought-to-be human or human-like facial image for making a threshold verification that the acquired image data contains a human or human-like facial image and in preparation for image normalization. Feature identification preferably makes use of eigenfeatures, generated according to the same techniques previously detailed for generating eigenfaces, to locate and identify human or human-like facial features such as the eyes, nose and mouth. The relative locations of these features are then evaluated with respect to empirical knowledge of the human face, allowing determination of the general characteristics of the thought-to-be human or human-like facial image as will be understood further herein. As will be recognized by those of ordinary skill in the art, templates may also be utilized to locate and identify human or human-like facial features according to the time and frequency domain techniques described for face finding **101**.

Once the initial preprocessing function elements **101, 102** have been accomplished, the system is then prepared to make an evaluation **103** as to whether there exists a facial image within the acquired data, i.e. whether a human user **40** is within the field of view of the system's camera **11**. According to the preferred method, the image data is either accepted or rejected based upon a comparison of the identified feature locations with empirical knowledge of the human face. For example, it is to be generally expected that two eyes will be found generally above a nose, which is generally above a mouth. It is also expected that the distance between the eyes should fall within some range of proportion to the distance between the nose and mouth or eyes and mouth or the like. Thresholds are established within which the location or proportion data must fall in order for the system to accept the acquired image data as containing a human or human-like facial image. If the location and proportion data falls within the thresholds, preprocessing continue. If, however, the data falls without the thresholds, the acquired image is discarded.

Threshold limits may also be established for the size and orientation of the acquired human or human-like facial image in order to discard those images likely to generate erroneous recognition results due to poor presentation of the user **40** to the system's camera **11**. Such errors are likely to occur due to excessive permutation, resulting in overall loss of identifying characteristics, of the acquired image in the morphological processing **104, 105** required to normalize the human or human-like facial image data, as detailed further herein. Applicant has found that it is simply better to discard borderline image data and acquire a new better image. For example, the system **10** may determine that the image acquired from a user **40** looking only partially at the camera **11**, with head sharply tilted and at a large distance from the camera **11**, should be discarded in favor of attempting to acquire a better image, i.e. one which will require less permutation **104, 105** to normalize. Those of ordinary skill in the art will recognize nearly unlimited possibility in establishing the required threshold values and their combination in the decision making process. The final implementation will be largely dependent upon empirical observations and overall system implementation.

Although the threshold determination element **103** is generally required for ensuring the acquisition of a valid human or human-like facial image prior to subsequent preprocessing **104, 105** and eventual attempts by the face recognition engine **30** to verify **106** the recognition status of a user **40**, it is noted that the determinations made may also serve to indicate a triggering event condition. As previously stated, one of the possible triggering event conditions associated with the apparatus is the movement of a user **40** within the field of view of the system's camera **11**. Accordingly, much computational power may be conserved by determining the existence **103** of a human or human-like facial image as a preprocessing function—continuously conducted as a background process. Once verified as a human or human-like facial image, the location of the image within the field of view of the camera **11** may then be relatively easily monitored by the tracking functions detailed for face finding **101**. The system **10** may thus be greatly simplified by making the logical inference that an identified known user **40** who has not moved out of sight, but who has moved, is the same user **40**.

After the system **10** determines the existence of human or human-like facial image data, and upon triggering of a recognition event, the human or human-like facial image data is scaled, rotated, translated and pre-masked **104**, as necessary. Applicant has found that the various face recognition engines **30** perform with maximum efficiency and accuracy if presented with uniform data sets. Accordingly, the captured image is scaled to present to the face recognition engine **30** a human or human-like facial image of substantially uniform size, largely independent of the user's distance from the camera **11**. The captured image is then rotated to present the image in a substantially uniform orientation, largely independent of the user's orientation with respect to the camera **11**. Finally, the captured image is translated to position the image preferably into the center of the acquired data set in preparation for masking, as will be detailed further herein. Those of ordinary skill in the art will recognize that scaling, rotation and translation are very common and well-known morphological image processing functions that may be conducted by any number of well known methods. Once the captured image has been scaled, rotated and translated, as necessary, it will reside within a generally known subset of pixels of acquired image data. With this knowledge, the captured image is then readily pre-masked to eliminate the background viewed by the camera **11** in acquiring the human or human-like facial image. With the background eliminated, and the human or human-like facial image normalized, much of the potential error can be eliminated in contrast normalization **105**, detailed further herein, and eventual recognition **106** by the face recognition engine **30**.

Because it is to be expected that the present invention **10** will be placed into service in widely varying lighting environments, the preferred embodiment includes the provision of a contrast normalization **105** function for eliminating adverse consequences concomitant the expected variances in user illumination. Although those of ordinary skill in the art will recognize many alternatives, the preferred embodiment of the present invention **10** comprises a histogram specification function for contrast normalization. According to this method, a histogram of the intensity and/or color levels associated with each pixel of the image being processed is first generated. The histogram is then transformed, according to methods well known to those of ordinary skill in the art, to occupy a predetermined shape. Finally, the image being processed is recreated with the newly obtained intensity and/or color levels substituted pixel-by-pixel. As will be apparent to those of ordinary skill in the art, such contrast normalization **105** allows the use of a video camera

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11 having very wide dynamic range in combination with a video digitizer **12** having very fine precision while arriving at an image to be verified having only a manageable number of possible intensity and/or pixel values. Finally, because the contrast normalization **105** may reintroduce background to the image, it is preferred that a final masking **105** of the image be performed prior to facial image recognition **106**. After final masking, the image is ready for recognition **106** as described herein above.

The above described embodiments are set forth by way of example and are not for the purpose of limiting the claims of the present invention. It will be readily apparent to those or ordinary skill in the art that obvious modifications, derivations and variations can be made to the embodiments without departing from the scope of the invention. For example, the facial image recognition engine described above as either a neural network or PCA could also be one of a statistical based system, template or pattern matching, or even rudimentary feature matching whereby the features of the face (e.g. eye, nose and mouth locations) are analyzed. Accordingly, the claims appended hereto should be read in their full scope including any such modifications, derivations and variations.

What is claimed is:

1. An interactive entertainment apparatus operable to biometrically identify an imaged one of a plurality of animate or inanimate objects having facial or face-like characteristics by measuring the facial or face-like characteristics of the imaged object, the interactive entertainment apparatus comprising:

an entertainment device positionable in proximity to said plurality of animate or inanimate objects, the entertainment device being capable of providing entertaining interaction with said plurality of animate or inanimate objects;

an acquisition device associated with said entertainment device, said acquisition device being adapted to acquire a representation of a facial characteristic of an object in proximity to said entertainment device, and said acquisition device being adapted to produce a signal relative to the acquired representation; and

a processor associated with said acquisition device in a manner to receive the produced signal from said acquisition device, said processor being adapted to compare the produced signal relative to data stored in memory and to provide an output signal indicative of a facial recognition of a particular one of said animate or inanimate objects;

wherein the entertainment device provides said entertaining interaction in response to said output signal indicative of recognition.

2. The interactive entertainment apparatus of claim **1**, wherein said entertainment device comprises a toy.

3. The interactive entertainment apparatus of claim **2**, wherein said toy comprises a doll and said acquisition device is mounted to said doll.

4. The interactive entertainment apparatus of claim **2**, wherein:

said toy comprises a doll; and

said acquisition device includes a camera contained within the head of said doll, said camera being situated to view objects located in front of the face of said doll.

5. The interactive entertainment apparatus of claim **4**, wherein:

said processor is mounted inside said doll.

6. The interactive entertainment apparatus of claim **4**, wherein:

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said doll is a teddy bear; and

said camera is mounted within the head of said teddy bear in a position to view objects through the eye of said teddy bear.

7. The interactive entertainment apparatus of claim **1**, wherein said entertainment device comprises a video game.

8. The interactive entertainment apparatus of claim **1**, wherein:

said acquisition device comprises a camera for acquiring a representation of all objects in proximity to said entertainment device;

said acquisition device is adapted to produce a signal relative to the acquired representation of all objects in proximity to said entertainment device; and

said processor is adapted to locate a characteristic portion of said produced signal, the characteristic portion being a portion that corresponds to a facial characteristic of one of the objects in proximity to said entertainment device.

9. The interactive entertainment apparatus of claim **8**, wherein:

said processor is further adapted to store representations of produced signals received from said acquisition device; and

said processor is adapted to compare a representation of a received signal relative to signal representations previously stored by said processor, to determine whether the received signal corresponds with a previous signal, and, if so, to provide an output signal indicative of recognition.

10. The interactive entertainment apparatus of claim **9**, wherein:

said processor utilizes artificial intelligence to compare signal representations and determine whether the received signal corresponds with a previous signal.

11. An interactive entertainment apparatus comprising:

an entertainment device positionable in proximity to a person, the entertainment device capable of providing entertaining interaction with the person;

an acquisition device associated with said entertainment device, said acquisition device being adapted to acquire a representation of a facial characteristic of the person in proximity to said entertainment device, and said acquisition device being adapted to produce a signal relative to the acquired representation; and

a processor associated with said acquisition device in a manner to receive the produced signal from said acquisition device, said processor being adapted to compare the produced signal relative to data stored in memory and to provide an output signal indicative of facial recognition of a particular person;

wherein the entertainment device provides said entertaining interaction in response to said output signal indicative of recognition.

12. A toy comprising:

a camera and digitizer for acquiring representations of human facial images;

a CPU associated with said camera and digitizer and capable of manipulating signals therefrom;

a speaker and sound controls whereby sounds produced by said toy may be controlled;

a computer readable medium having instructions for locating and biometrically recognizing said human facial images and providing an output facial image recognition signal indicative of a particular person;

wherein the toy provides entertaining interaction in response to said output facial image recognition signal;

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said computer readable medium further having instructions capable of recognizing expressions in said facial images and providing a facial expression recognition signal indicative of recognition of said expressions; and

wherein said sound controls are responsive to said facial expression recognition signal to modify the sounds produced by said toy in relation to said facial expression recognition signal.

13. The toy of claim 12, wherein:

said toy further comprises a microphone for the detection of sounds in the proximity of said toy; and

said computer readable medium further having instructions adapted to recognize human speech included in sounds detected by said microphone and control the toy in response to recognized human speech.

14. The toy of claim 13, wherein:

said sound controls include software controls included in said software, said software controls being adapted to produce synthesized speech; and

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said toy further comprises animation controls adapted to control one or more motions of the toy; and

said animation controls are responsive to said facial expression recognition signal to animate said toy in relation to said facial expression recognition-signal; and

said computer readable medium further having instructions adapted to produce synthesized speech choreographed with mechanical animation in response to recognition of said facial images and in response to recognition of said expressions.

15. The toy of claim 14, wherein said computer readable medium has instructions adapted for sending and receiving E-mail and providing other Internet-related interaction once said facial image is recognized.

* * * * *

CERTIFICATE OF FILING AND SERVICE

I hereby certify that on this 29th day of June, 2015, I caused this Non-Confidential Brief of Appellant to be filed electronically with the Clerk of the Court using the CM/ECF System, which will send notice of such filing to the following registered CM/ECF users:

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CERTIFICATE OF COMPLIANCE

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Dated: <u>June 29, 2015</u>   <u>/s/ Michael K. Mutter</u>
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